

# The Mining Journal

## RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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LONDON, SATURDAY, NOVEMBER 2, 1878.

[WITH SUPPLEMENT.] {PRICE ..... SIXPENCE.  
PER ANNUM, BY POST, £1 4s.

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50 Chontales, 13s. 6d. 20 Leadhills, £2. 10 Roman Grav., £23½.  
50 Colorado, 50 Llanyrwst. 10 Rookhope, 10s. 6d.  
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50 East Van, £23½. 25 Pant-y-Mwyn. 6 Tankerville, £23½.  
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\* SHARES SOLD FOR FORWARD DELIVERY (ONE, TWO, OR THREE MONTHS)  
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SPECIAL BUSINESS. Fortnightly Accounts opened on receipt of the usual cover.  
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East Caradon, 6s. 6d. 5 Minera. 30 Wye Valley.  
Exchequer, 5s. 6d. 20 New Quebrada, 31s. 9d. 10 West Chiverton, 15s.  
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Flagstaff, 5s. 6d. 10 Pateley Bridge. 15 Wh. Grenville, £23½.

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5 East Pool, £23½. 50 Marke Valley, 10s. 9d.  
10 Exchequer, 6s. 50 Mellanear, £23½.  
100 East Chiverton. 50 North Hendre.  
40 East Van, 41s. 9d. 200 Penstruthal, 4s.  
100 Flagstaff, 8s. 25 Penmont.  
50 Frontino, £23½. 100 Parys Mountain, 5s.  
40 Gawton, 8s. 40 North Busy.  
50 General Ming., £23½. 100 Pestarena, 4s. 3d.  
200 Gold Run, 5s. 3d. 30 Pant-y-Mwyn.  
20 Grosvenor, £23½. 65 Pandora, 10s. 3d.  
20 Glenroy, 10s. 6d. 25 Red Rock, £23½.  
20 Gorse & Merilyn. 200 Rossa Grande, 1s. 9d.  
35 Hultafall, £3. 25 St. Harmon.  
25 Hornachos, £12½. 5 Wheel Kitty, 23s. 6d.  
200 Credit A. 60 Wheel Uny, £10.  
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Leadhills, 37s. 6d. Gas Light and Coke. Hultafall, £3.  
Llanyrwst. Imperial Continental. Javali, 7s. 9d.  
Pandora, 10s. Surrey Consumers. Last Chance, 14s.  
Penstruthal, 4s. 3d. Erie Reconstruction. Kapanga, 18s. 9d.  
Parys Mountain, 5s. Port Phillip, 10s. 9d.  
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COLLIERIES.—Special Business in Bilson and Crump, Chapel House, Cardiff, and Newport Abercrombie.

MISCELLANEOUS.—Investors should notice the low prices reached by General Credit, Hudson Bay, National Discount, Mercantile Bank, Credit, Brighton Aquarium, and Mexican Railway.  
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60 Pant-y-Mwyn.

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24 Argentine, 10s. 70 Flagstaff, 8s. 20 New Quebrada, £13½.  
65 Chontales, 10s. 25 Hultafall, 11s. 40 Port Phillip, 10s. 9d.  
90 Don Pedro. 50 I. X. L., 4s. 3d. 30 Yorke Peninsula, 4s. 6d.

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100 Blacon Caclan, £4. 15 Great Holway. 20 Pateley Edge, £3 15s.  
30 Cambrian, £2. 10 Glenroy, 11s. Penstruthal, 4s. 6d.  
10 Colorado, £2 7s. 6d. 20 Hultafall, £3. 20 Roman Grav., £2 6d.  
20 Court Grange, 17s. 6d. 30 Last Chance, 15s. 10 Richmond, £9 17s. 9d.  
2 Cape Copper, £23½. 20 Leadhills, £2. 25 Rookhope, 11s.  
20 Cakemore Colliery. 50 Javali. 30 South de Eresby, 25s.  
100 Don Pedro. 25 Ladywell (ful. p.), 11s. 10 Tankerville, £2 10s.  
15 East Van, £2 5s. 40 Morfa Du, 13s. 6d. 7 Tyn-y-Fron, 18s. 9d.  
10 Eberhardt, £3 17s. 6d. 20 N. Zea. Kap., £1. 4 Van, £15.  
50 Exchequer, 5s. 3d. 15 N. Quebrada, £1 12s. 6d. 15 W. Chiverton, £1.  
10 East Caradon, 7s. 6d. 20 Pant-y-Mwyn. 25 West Pateley Bridge,  
30 Frontino, £2 2s. 6d. 30 Picton Silver-Lead, £1 11s. 6d.  
50 Flagstaff, 8s. 6d. 150 Pestarena, 4s. 9d. 25 Yorke Peninsula, 5s.  
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Shares bought and sold at not prices. Telegrams promptly attended to.

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TO THE PUBLISHER OF THE "MINING JOURNAL," 26, FLEET STREET, LONDON.

TORQUAY, 25TH OCTOBER, 1878.

**I, DAVID RENTON, M.D., HEREBY DO GIVE PUBLIC**  
NOTICE that I last July RELINQUISHED ALL THE SHARES which I HELD in EAST WHEEL LOVELL MINE, Helston, Cornwall, and that the RELINQUISHMENT was FORWARDED to the Purser, Mr. ROGERS.

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## Lectures on Practical Mining in Germany.

## CLAUSTHAL MINING SCHOOL NOTES.\*—No. XCIV

BY J. CLARK JEFFERSON, A.R.S.M., WH. SC.,  
Mining Engineer, Wakefield.

(Formerly Student at the Royal Bergakademie, Clausthal).  
[The Author reserves the right of reproduction.]

## SECTION V.

One of the most important considerations in connection with the choice of position of a shaft for working a given area of coal is the direction and amount of the dip of the seam. Where the seam is very highly inclined, as in the North of France and Belgian coal field, the Ruhr district in Germany, &c., the seams will be connected at various depths with the shaft, by means of drifts carried through the country rock. Where the seams are nearly level, or not of such great inclination, the coal from the seam will be brought into the shaft at one point where the shaft cuts the seam, or by the means of a short drift. In this latter case, therefore, it is important that the shaft should be on the dip side of the estate, since otherwise a large amount of coal would have to be drawn up hill by horse or engine power; and what is of still more importance, where considerable quantities of water are met with, the water would have to be forced up by pumps, or drawn up to the bottom of the shaft in tubs. This latter method will often turn an otherwise good road into a bad one. When the shaft is on the dip side the water could be conducted along proper channels to the shaft sump, and by means of self-acting planes the coal could be lowered to the pit bottom.

The same reasons which lead to the choice of the dip side of an estate as the position in which the shaft should be sunk will come into consideration when the estate is intersected by faults. When the dip of the fault is in the same direction as the dip of the coal the above rule will not be affected, and the shaft should be sunk on the dip side of the coal on the dip side of the fault. When the dip of the coal is in the opposite direction to the dip of the fault, and if the amount of throw be not very considerable, then it will be most advantageous to sink the shaft on the dip side of the coal to the rise side of the fault, and to connect the two parts of the seam by a drift slightly inclined downwards in the direction of the dip of the seam. Where the seams run pretty nearly level the position of the shaft with regard to any faults is then of greater importance: the shaft should be sunk on the dip side of the fault. The presence or absence of faults affects the advantages or disadvantages of any position chosen for a shaft so much that it would in many cases more than repay the expenses of boring to be able to ascertain the presence and amount of any throws intersecting an estate.

In some districts, such as those in the neighbourhood of Mons and Valenciennes, in Belgium, where the strata are highly inclined, the nature of the superposed rock is a matter of paramount importance to the facility for sinking. Some of the strata bear water to such an extent that the sinking of a shaft through them by the ordinary method may be impossible, and on account of the great inclination of the strata a distance of a few hundred yards to the one side or the other might allow of the shaft being sunk vertically, without intersecting these water-bearing strata.

In the case of coal seams close to the sea side, or near the estuary of a river, and where the upper seams have been worked so far under and so near the bed of the river that there is any probability of the water breaking in at some future date, then it may be preferable to sink an entirely new shaft to the rise side of the outcrop of the already worked out seams, in order to open out the deeper seams, and so to avoid any liability of the water on bursting into the upper seams flowing down the shaft into the lower seams.

Even in an inland coal field the risk may be run of having the mine suddenly drowned out if the shaft is sunk near to a river which is at any time liable to floods.

When the upper seams in an estate have been worked out and abandoned, and are probably filled with water, the sinking to the lower seams may still be effected with comparative ease and freedom from coal, provided that a sufficiently large pillar of unworked coal has been left round the shafts sunk to the upper seams. The shafts to open out the lower beds will then be sunk so as to pass through these solid pillars, and care must be taken that the position is such that there is no liability of the shaft coming into any of the roadways driven through the pillar.

Lastly, the mouth of the shaft should be in such a position that there is a suitable downhill gradient to any wharves, or roads, or railway lines; and in the case of metalliferous mines so that there is a suitable fall in the neighbourhood for the dressing works, as otherwise expense of carting the undressed ore up hill to the commencement of the dressing works would be incurred.

It will not often occur in actual practice that all these conditions can be satisfactorily fulfilled, but before fixing upon the position for a shaft the relative value of these considerations should be thoroughly discussed.

## FORM OF SHAFTS IN HORIZONTAL SECTION.

The form of shafts in horizontal sections is, generally speaking, either rectangular or round, and as a transition from one to the other may be considered the polygonal form—the square form; and the elliptical form, a modification of the round. Strictly speaking, we might be more correct in considering the polygonal form as a modification of the circular form.

The RECTANGULAR form is almost universal in the case of the metalliferous mines, especially when the shaft is sunk on the lode, and is, therefore, inclined and not vertical. In this case the longer axis of the shaft is parallel to the strike of the lode; indeed, where the thickness of the lode and the character of the country rock are suitable, the longer sides of the shaft are formed by the hanging and lying walls of the lode, the shorter sides being formed by a safety or shaft pillar (of the lode) left on both sides. The irregularity of the dip of a lode will sometimes entail a deviation from the general direction of the shaft, and in order to make the shaft more convenient for winding, &c., it will be necessary to round off the angularity where the dip changes; this will leave either the hanging or lying side concave or convex, as the case may be. Where a rectangular shaft is sunk through stratified ground, where the dip is considerable, the position of the shaft should be so arranged that the longer sides are at right angles to the strike of the strata, since the joints of cleavage generally run parallel with the stratification, and the sides give way much sooner in this direction. When the shorter sides are parallel to this direction the area exposed to the liability of the sides slabbing off is reduced, and the strength of the sides is also increased. This liability to the slabbing off might perhaps be still further reduced if the axis of the shaft was inclined to the strike of the strata; the sinking of the shaft becomes, however, much more inconvenient, the sides of the shaft, especially the corners, would require much after dressing. The rectangular form is decidedly objectionable where the shaft has to be carried down water tight, and where there is any liability to great pressure on the sides. It has the advantage, however, under other circumstances of a more easy division of the shaft into compartments, and can be more firmly timbered than a round one with the same amount of timber. The working out of the square corners requires not only great care, but a greater amount of dressing (i.e., manual labour) during the sinking.

The SQUARE form is of rare occurrence, chiefly in stratified ground, where the pressure is considerable, it being a stronger form than the rectangular. Where the latter is divided into partitions formed of strong struts, set pretty closely together, the advantage in strength of a square shaft of the same area may be considered to be doubtful. The periphery is less than that of a rectangular shaft, and consequently less material is required for lining; the cost of sinking is probably greater than that of a rectangular shaft.

The CIRCULAR form, and as a modification the POLYGONAL form, are best in the case of watertight linings, and of considerable pressure, being the strongest forms for a given area, and the periphery being the least of any figure for the same area, offers less resistance to the ventilating current, and is, therefore, preferable for ventilating purposes; a less amount of dressing is required, and there being no corners the effect of a shot can be used to more advantage. As the greatest disadvantage offered by the circular form the inconvenience of dividing the shaft into suitable partitions is added. This disadvantage is more apparent than real, since in coal mines it is only the winding partition which requires to be rectangular, and the pumps can be placed between the bearers and the periphery of the shaft. In most coal mines the winding shaft is used for winding alone, the pumps being placed in the upcast shaft, and where the mechanical ventilation is adopted the inconvenience and damage to the piping, &c., owing to heating and cooling, which takes place when a furnace is used for ventilating, is avoided. When it is required to make the shaft water-tight by means of an iron lining the circular form alone can be recommended. The polygonal form is used chiefly for timbering temporarily, preparatory to the insertion of a brick lining, though sometimes in the case of permanently water-tight timber lining, when it consists of solid crib timbering.

The ELLIPTICAL form bears the same relation to the circular that the rectangular does to the square form, and except that it is used almost if not exclusively in stratified ground the same relative remarks will apply.

The dimensions and the modes of partitioning shafts will be best illustrated by the following examples, given for the most part in Lottner-Serlo's "Manual of Mining."

In the metalliferous mines of the Harz the rectangular shafts vary from 13 ft. to 27 ft. in length, and from 4½ ft. to 9 ft. in width, divided crossways into two or three rectangular compartments.

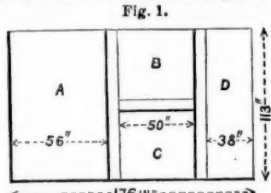


Fig. 1 represents a shaft in the Mansfeld district. The dimensions are given in inches. A is the pumping shaft, B the shaft for the man engine, C the ladder shaft, and D the winding shaft.

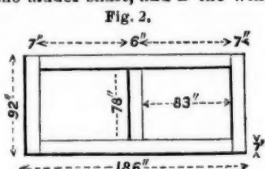


Fig. 2 represents the Skalley pit, No. 1, at the Duttweiler Colliery, near Saarbrücken. Both divisions are used for winding, one cage in each division carrying two cages, holding 10 cwt. each.

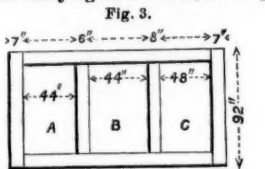


Fig. 3 represents the Skalley Pit, No. 2, at the same colliery. A and B are winding shafts, in which the cages carry four cages of 10 cwt. in four stages above each other; C is the travelling and pumping shaft.

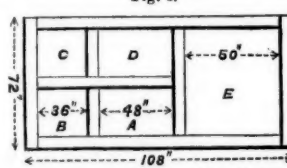


Fig. 4 represents the Smith shaft at Eisleben. A comparison of this with Fig. 1 will illustrate the principle laid down in the Mansfeld district in arranging the compartments, so that access may be easily obtained from the travelling or ladder shaft to the remaining compartments. In Fig. 4, A is the travelling or ladder shaft, B and C are winding shafts, D is the man-engine shaft, and E the pumping shaft.

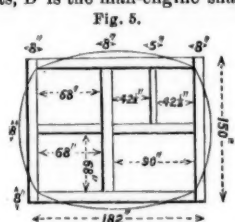


Fig. 5 represents the old shaft of the Constantine the Great Colliery, near Bochum, which is lined with four curved walls; and

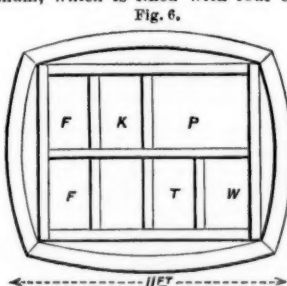


Fig. 6 a shaft at Zwickau, in which P is the pumping-shaft, FF are the two winding shafts, K is the man-engine shaft, T is the ladder or travelling shaft, and W is the ventilating shaft.

NEW SPRING MOTOR.—The improvements patented by Mr. H. G. FRASER, of Cloudeley-road, Islington, consist in employing the tensile force of a vulcanised india-rubber spring either singly or in multiple form, to act upon a screw by one end of the spring being attached to the nut or female portion of the screw, which nut works in parallel guides. The other end of the said springs are attached substantially to the framework of the machine. The male screw is furnished with journals and fitted in suitable bearings fitted at ends of machine. It will be seen that by revolving the male screw by handle or other suitable appliance he causes the nut or female of screw to travel in a plane of the parallel guides and distend the springs any given distance, which springs in returning to their normal position give out their multiplied force upon the male screw, and communicate a rotary motion to the said male screw and to any machinery thereto attached, the power being in proportion to the number of springs used, and the number of revolutions according to the pitch of the screw; and the apparatus will raise, pull, or

propel any body or material to be overcome in any required direction from the horizontal to the vertical line. He likewise uses the resilient force of india-rubber springs in the opposite direction, for the purpose of lowering bodies or material, by having a less number of springs acting upon the nut or female screw than will resist the weight of body to be lowered, thus the weight descending will rotate the male screw, and cause the nut to travel along the screw, and stretch the springs in proportion to the weight of the body or the material descending. The apparatus in this form would be of great and special value in case of fire in a dwelling, by a person attaching himself to a wire-rope attached to a sheave fitted to male screw, in which case he could descend from any height in safety. The power of each spring being of a given strength, and the number required to overcome different weights being given on a tablet attached to machine, any number of persons of different weights might descend, and on reaching the ground, by detaching himself, the rope would rapidly ascend, by the springs being more powerful than the weight of rope, and thus be ready for use again. The improvement further consists in projecting as well as raising and lowering bodies, and is performed by giving a rotary motion (by aid of the apparatus previously described) to any body to be projected, which said body shall have attached to its lateral edges fans set at an angle best suited to travel through and overcome the resistance of water or air. By fitting the body to be projected on one end of the male screw he can communicate such rapid motion to the body to be projected as to cause it to travel a considerable distance in any direction, according to the power of the springs applied. The invention can also be used for propelling bodies by the motive power given to the male screw being communicated to a system of cog or spur wheels, as condition of object to be propelled may require.

## MACHINE MINING—THE ECLIPSE DRILL.

In noticing in last week's Journal the awards of prizes at the International Exhibition at Paris, it was suggested that the silver medal obtained by Messrs. Hathorn and Co., of Charing Cross, for a rock drill was for the new Eclipse drill recently referred to in the *Mining Journal*. This appears to have been actually the case, and as the drill is at present attracting considerable attention a detailed description of it will not be uninteresting. The new drill was patented, through Mr. Ernest de Pass, patent agent, of Fleet-street, for Mr. A. H. Elliott, of New York, and as the patent was sealed as late as April 12, there was only just time to get it admitted for competition; so confident, however, was the inventor in the power of the machine that he sought no time for preliminary trials, and the result has been shown that these were altogether unnecessary. The Eclipse drill is of the percussive class, and is used either with steam or compressed air. Its valve is moved by air or steam, and in one arrangement the piston is rotated and the cylinder fed to the rock by hand.

The ordinary D valve is used, but it is made circular, and has at each end a piston turned to fit the valve box, and is provided with a guide to prevent its turning around. The valve box has exhaust ports for the valve pistons, and these ports are carried across and to opposite ends of the valve box, and lead down into the steam cylinder through suitable openings. From this the exhaust is carried into the main exhaust port by a groove or recess turned in the piston, and thence by openings in the side of the cylinder. In the construction of the valve guide a hole is bored through the circular-shaped D valve lengthwise, and is slotted through for a portion of the way to receive a feather, which is let into the bolt passing through the valve. This bolt answers the several purposes of holding the valve box caps firmly to their places, of keeping the valve in position, and of affording support to the valve, and thus lessening its wear on the valve seat. The valve box is supplied with rubber cushions at each end, which are protected by steel plates, so that the valve strikes against the face of these plates, to which the cushions are clamped, and thus prevents the jamming of the rubber and breakage of the valve from concussion. The piston carrying the boring bit is of ordinary construction, being a long or double piston with packing rings at each end, but it has a groove or recess turned out in its centre for conducting the exhaust steam or air from the valve pistons into the main exhaust port. The upper end of the piston is bored out to receive a fluted nut and the fluted bar used for rotating the piston. This fluted bar and feed screw are made of one piece of steel. The cylinder is carried up and down by a collar. The screw of the piston passes through a nut fastened to the end of the tripod, and when the screw is revolved by the crank the cylinder is carried up and down, as required, and the piston is rotated at the same time. The tripod is adjustable, and particularly so to quarry work, its legs being telescopic, and the back leg being hinged so as to give the angle required.

Although automatic feed is not generally admired by practical men, the arrangement of the Eclipse drill does not prevent its being used when preferred. For this purpose a shaft is placed upon the outside of the cylinder, and extends from about its lower end to the top of same. From this shaft a projection or enlargement extends to the inside of the steam cylinder at its lower end. This projection is bevelled, and when the rounded edge of the piston comes in contact with it the projection is forced outward from the inside of the cylinder, and imparts a rotating motion to the shaft, which in its turn operates a feeding device at the top end of the cylinder by disengaging a pawl from a rotary feed nut, which nut advances the cylinder upon a screw in the usual way. When the piston returns upon its upward stroke the projection upon the shaft is relieved from contact with the piston, and a spring does the feeding by forcing the pawl against the teeth of the rotary feed nut, and at the same moment carries the projection back to the inside of the cylinder. It is evident, therefore, that if the rock is cut away sufficiently for the piston to descend against the projection, in forcing the same outwards the feeding device at the top is regulated thereby. To operate the machine the air or steam is turned on, and the valve is caused to move upwards, which opens the main supply port to the lower end of the cylinder, and at the same time frees the exhaust from the upper end. The piston immediately rises till it closes the valve to return downwards and supply steam or air to the upper end of the piston, and thus move the piston to the rock. This movement of the piston closes the exhaust from the lower end of the valve box, and opens its upper end, causing the valve to rise and continue the motion.

The observations made in last week's Journal upon the irregularity of the awards are confirmed by several exhibitors, who are not so much discomfited with the honours they have themselves received as with the unfairness of permitting the same exhibit to take two chances. They very reasonably urge that for making an award upon a given exhibit it is unlikely the jurors in several classes would be equally competent to give a useful decision, and they regard as a mere tradesman's trick the system of plural shows, and one which no respectable manufacturer would resort to. It may be assumed the jurors in each class have been selected for their special knowledge of the exhibits which would properly come within their class, and that whilst they would be unlikely to permit any real merit to go unrewarded they would be equally unlikely to give too high a prize. Less competent judges being comparatively unacquainted with the matters upon which they pass judgment are prone to regard everything put before them in general use, and of new, although as a matter of fact it may be in general use, and more than second-rate merit, the result being that by this underhand proceeding of plural exhibit higher awards have in some cases been obtained than any competent judge would have been disposed to grant.

Another objection to this plural exhibit system is that as the aggregate number of prizes to be awarded was predetermined, and as the proportion of each class of prize was not allotted to the several classes of jurors, it is confidently stated that the jurists of certain classes had nothing higher than silver medals at their disposal, owing to some other jurists with more haste than wisdom having already awarded 2510 gold medals, although but 2470 were at their disposal. One of the excluded classes was the 54th, and to this rather than to any undue stringency on the part of the jurors must

\* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergsrath Dr. von Gumboldt, Director of the Royal Bergakademie, Clausthal, the Harz, North Germany.



be attributed the character of the prizes given in that class. The public, however, will have no difficulty in utilising the opinions of the more competent jurors (that is to say, competent upon the particular subject to which the exhibit belongs) if they assume that where more than one award has been made the lowest is that by which the merit of the exhibit is truly represented. It will be remembered that after the London Exhibition of 1862 more than one exhibitor enjoying the highest commercial reputation advertised as a merit that they had received no prize from the Exhibition juries, and, upon the same ground, it will be a far greater honour to claim, in connection with the Paris Exhibition, that a given distinction has been earned in one class only, and with one exhibit, than to claim medals of all metals earned by the underhand proceeding referred to. It is, perhaps, still not too late to withdraw in the case of plural awards for the same article all but the lowest; and this would give undoubted satisfaction both to the more honourable exhibitors and to the public.

#### IMITATION BRONZE.

For the production of articles of ornament at a low price, Messrs. SCHONFELD and GUILMET, of Paris, have invented a process of manufacturing articles in hollow hardened india-rubber, coppered by electro metallurgy, so as to imitate bronze d'art, and capable of being gilded, nickel, silvered, bronzed, or otherwise decorated. They commence by moulding the article of supple india-rubber to the desired form by ordinary means, and after that they harden it completely by any of the processes usually employed for the purpose. The article so moulded and hardened is then fettled, polished, and even chiselled, if its nature allows it; it is then scraped, if needed, so as to give it an even surface, and then coated with black lead or other process, as is ordinarily done in electro-metallurgy, so as to render it conductor, and consequently able to receive the galvanic deposit. The article is placed in the bath where it is galvanised, and a deposit of copper or brass more or less thick is obtained on its whole surface, or even in proceeding by fractions of its surface some parts may be obtained with a red deposit and some with a yellow deposit, according to the nature of the article. It can then be bronzed by the usual processes, and a perfect imitation of the articles in bronze will be thus obtained. It is also ornamented or decorated by any of the ordinary processes of nickeling, silvering, gilding, bronzing, and the like. The articles so made have quite the appearance of bronze nickel, gilded, or silvered, and they have also the advantage of being very light and of a very low price. They are strong, and sufficiently elastic to support repeated shocks without being bruised or dented.

For the copying of works of art the process will, it is considered, prove very useful, for it will be understood that by it they can make all kinds of objects in imitation of bronze, such as statuettes, groups, vases, lamps, subjects for clocks, and the like. So as to readily understand the importance of the invention, a comparison must be made. If a group is to be produced in a solid mass of india-rubber, the material being dear, the net cost will exceed the price of the bronze; but if to be produced in thin hollow hardened india-rubber its net price will then become even lower than that of zinc. Besides this, the hollow india-rubber being produced by a dilation or expansion of the air in the interior of the articles, the details of the mould will be perfectly reproduced, and after the india-rubber is hardened and bronzed it imitates perfectly groups in bronze.

#### ECONOMIC MANUFACTURE OF ZINC.

##### THE PROFITABLE TREATMENT OF MIXED BLENDE AND

##### GALENA ORES MADE EASY.

[Concluded from last week's Journal.]

The furnace is composed of a massive rectangle shell, the two larger faces of which rest on angle irons carried by columns prolonged to the exterior of the furnace only, thus leaving the under side of the furnace free, and bound together by tunnels, which form a platform, serving as a working place for the men. The spaces left under the tunnels between the columns form galleries, which conduct under the furnace where the discharge of the retorts and the removal of the residues take place. The rectangular shell, forming the furnace is closed above and below by two tunnels, pierced from distance to distance, and symmetrically with regard to the major axis of the furnace, with openings having the form of the crucibles to be introduced into them. The height as well as the section of the crucible may be varied, but an oval form is preferable to a round one. The crucibles are introduced at the upper side of the furnace, and rest under the lower tunnel in cast-iron grooves, formed on the upper part of boxes of the same metal, which are supported by little columns. The attachment of the retorts to the metallic boxes is effected at the moment when the crucibles are introduced by the use of moist clay. Each cast-iron box is, moreover, furnished on the side nearest the largest face of the furnace with an opening to facilitate the discharge of the crucible, and so placed that the joint of the crucible, with the box, can be examined, and if necessary made good. The box is closed by a cover, which can be all the more easily luted because it can be got at from the outside and during the whole operation. The object of this box is not alone to support the retort or the crucible, but in the treatment of mixed minerals, containing sometimes as much lead as zinc, it serves to collect and retain the lead which becomes concentrated there in the form of granules disseminated in the residues, and from which they may be separated in the metallic state by simple screening. Another advantage of these box receptacles is that resting on independent columns of the furnace, and themselves carrying the vertical tubes or retorts, the whole of the charge to be reduced resting upon them, so that the furnaces are not injured by them.

As to the upper part of the crucible through which the zinciferous matters are charged, it is closed by a brick stopper, so formed that it can be easily luted. The crucibles are also so fixed on the boxes that they cannot move. Each crucible is, moreover, pierced towards the top with a round or oval opening, in which is fixed the condensation tube for the zinc reduced. All the condensing tubes, slightly elliptical in form, are arranged much in the same way as in ordinary zinc furnaces. The condensing tubes are located in niches made in the walls of the furnace, the thickness of which is increased at back or in front, so that a back or front plate of refractory material leaving between them and two little vertical walls at the end of them the niche in which the temperature can always be so moderated as to prevent the volatilisation of the zinc reduced. There are eight holes for observing the temperature produced in the two larger faces of the furnace, and false tunnels to facilitate the repairing of the lower tunnel in case of necessity. The tunnels of the furnace are formed of arches springing from the two larger faces of the furnace, and uniting in pairs all the retorts contained. The heating of the furnace may be affected by a hearth placed along the shorter face of the furnace, or by gas. The system of heating directly by the hearth will be the less advantageous as the number of retorts increases, these being arranged in two lines parallel to the longer axis of the furnace. In heating the furnace with Siemens' regenerators the gas would be made to circulate from one end of the furnace to the other, and always lengthwise, so as always to leave the working faces free, and so that the discharging platform may remain cool, and thus always accessible to the workmen. The furnace is designed principally for the treatment of the mixed minerals—that is, mixed oxides of lead and zinc; but it is equally applicable to mixtures of other oxides, such as zinc and iron, zinc and copper, and so on, and also for the treatment of zinc ores properly so called, such as are usually met with in commerce.

This process, it will be seen, is distinguished by the special construction of furnace which permits of the use of vertical retorts, which offers the most simple mode of charging and discharging, and further, which is applicable to the reduction of every kind of zinc ores, whether the metal be associated with other metals or not, and whatever may be the proportion of each. Among the advantages claimed for this furnace are its applicability to the treatment of mixed minerals, the reduction of which in other furnaces is scarcely

possible owing to the large consumption of crucibles occasioned; the diminution of labour cost, the charging and discharging, being so simplified as to render the employment of special workmen for these duties unnecessary; the small consumption of refractory materials, owing to the smaller number of pieces used, and the facility for getting at the parts, diminishing wear and tear; moreover, the retorts being vertical the charging has no tendency to break them, and the reduced metal has no influence in corroding them, so that they last much longer. Another advantage is the small consumption of fuel, the crucibles being but a short time open for discharging and recharging, and their replacement also being equally accelerated. The cause of the cooling of the furnace is removed. Again, there is a larger production from the furnace being less subject to cooling, the charge is manipulated more quickly, and thus a larger number of charges are treated in a given time. And, lastly, the zinc is obtained in a state of greater purity, since no other metal can at the same time as the zinc be carried into the condensing tubes. Indeed, the lead as soon as reduced falls to the bottom of the crucible, and only the arsenical vapours could be deposited with the zinc. In practice, however, it is found that at the temperature of the condensing tubes these vapours are still much too volatile to condense, and consequently pass on without in any way affecting the purity of the zinc—this has, indeed, been found to be the case in every known system of furnace. The last, and not the least, advantage results from the general form of the furnace, which permits not only the ready removal of the residues from the retorts, always a troublesome job with other furnaces, but also the rapid removal of them, since below the furnace being always free they can be received directly into wagonettes run in to the foot of the retorts; the workman, too, will have his labour rendered more healthful. It is explained, in conclusion, that the disposition of the niches of the furnace has a tendency to strike down the flame to the sole thereof, so that the upper part will be kept well heated, though not at the expense of the lower part. The tubes will consequently be perfectly heated for their entire height, and the reduction of the charges will be effected under the best possible conditions.

#### FOREIGN MINING AND METALLURGY.

The Verviers Chamber of Commerce has just issued its report for 1877. The metallic mines of the Arrondissement of Verviers produced last year 30,217 tons, as compared with 28,542 tons in 1877. The net profit realised last year was 17,459*l.*, as compared with 10,027*l.* in 1876. The number of workmen employed was 1310 in 1872, as compared with 1219 in 1876. The production of ironstone in the Arrondissement in 1877 amounted to 10,350 tons, as compared with 3700 tons in 1876. Eight foundries were in operation in the Arrondissement last year; these foundries employed 174 workpeople, and produced 2515 tons, as compared with 2746 tons in 1876. A new industry has been recently introduced at Verviers—the mechanical manufacture of iron horse-shoes; the production at present effected may, if necessary, be largely increased. M. Salvador Morhange, Consul-General of Belgium at Palermo, has forwarded to his Government a report with reference to the new lines decreed this year by the Italian authorities. M. Salvador Morhange has done more; he has personally recommended Belgian material to the concessionaires of the new lines, and he states that he has received satisfactory promises from them. It is stated that an English firm—the name has not transpired—has contracted for the delivery of 10,000 tons of steel rails, at 5*l.* 18*s.* 4*d.* per ton to the Alta and Beira Railway, Portugal, of which the Financial Society of Paris has recently obtained a concession. On the other hand, it is affirmed that a Belgian establishment is now rolling steel rails for an English colony.

There are complaints of a scarcity of rolling stock on the Belgian State railways, these complaints proceeding from the Belgian coal trade. The movement of beetroots upon the Belgian State network has occasioned a temporary scarcity of plant upon the system. The administration is endeavouring to mitigate the difficulty, and has appealed to consignors and consignees to carry on loading and unloading operations with greater celerity. The Belgian Minister of Public Works is also about to give out an order for 700 additional trucks. For the rest, the Belgian coal trade, notwithstanding a well-sustained demand for coal for domestic purposes, has remained extremely quiet. The Belgian Minister of Marine let a contract on Wednesday for 6000 tons of coal. A contract is also about to be let for the briquettes and agglomerates required for the Belgian Navy during the first half of 1879.

In the Haute-Marne (France) group the past month has proved less sterile than in September. Rather more orders have come to hand, and there are also proposals for other business, with a prospect of a satisfactory understanding being arrived at. In the Nord rolled iron is quoted at 5*l.* 16*s.* to 6*l.* 2*s.* per ton, according to the orders received and the sale radius. To the large Paris houses the price is rarely above 5*l.* 16*s.* per ton; but to the provincial houses the quotation is pretty generally 6*l.* per ton, while small orders are taken at 6*l.* 2*s.* Special iron for building purposes appears to be rather neglected. Pig for refining has been quoted at Nancy at 2*l.* 6*s.* per ton; there has been no change in the quotations current for second fusion pig. In the Loire-et-Rhone group business has been generally quiet at about former rates. In a letter addressed to the great French railway companies, M. de Freycinet, the French Minister of Public Works, has invited them to hasten on to completion the new works which they have on hand. The object of the Minister's circular is apparently to increase the means of employment at the disposal of the French working classes.

#### THE NEW MAN-ENGINE AT PRIBRAM.\*

The man-engine in use in the Maria shaft at Pribram at present extends to the 24th level, or 708 metres (2322 ft.) below the surface; but the mine, opened out, and ore workings have been commenced from four lower levels, the lowest, or 28th, being 900 metres deep, and further sinking down to 1000 metres is in progress. It has, therefore, become necessary to make provision for an extension of the engine to a depth of 1000 metres at least, within a short time, or an addition of 292 metres (957 ft.) to the present length of rods.

As it is desirable upon the score of economy to keep the moving weight down to the lowest possible point, in order to preserve the coupling-rods, bell-cranks, and other moving parts at present in use, it has been decided to substitute an entirely new rod, which, for the whole length of 1000 metres, shall be no heavier than the present one of 702 metres. This can be done by using Bessemer steel of a tensile strength of 65 kilogrammes per square millimetre (41 tons per square inch) instead of iron; the former metal has, therefore, been selected for the new engine. This is to be made in lengths, and solid throughout; the method formerly adopted, of building up the rod from a series of flat bars (three to six according to the section required) laid side by side and united by fish-plates and through-bolts, being considered to be not only expensive but objectionable in many ways. More particularly it is found that from irregular motion in the bolt holes, the strains on the constituent bars are not uniformly distributed, and consequently fractures from overloading are not uncommon. The replacing of a fractured plate is, however, a very difficult matter, and in some cases is practically impossible.

In order to obtain uniformity in the quality of the metal, the rods are to be forged and not welded. The section, a rectangle whose sides are in the fixed proportion of 1 to 2 throughout, is reduced in dimensions at every division of eight rods. In the lowest, or 33rd division, where the rods are smallest, the sectional area is 550 square millimetres (868 square inch), the breadth being 33.4 millimetres, and the thickness 16.7 millimetres; while in the first, or uppermost, the dimensions are—breadth, 95.4 millimetres; thickness, 47.7 millimetres; area 4541 square millimetres (7 square inches). The minimum section of the bottom series is somewhat larger than that theoretically required, partly in view of a possible extension in depth, and partly to provide for a certain reduction in area by rusting. The rods of the present engine, which have been in use since 1867, are much rusted throughout. At the end of each rod a projecting

square head is forged, over which are placed a pair of claw-ended coupling-plates secured by four through-bolts. The butts of the rods are not in contact, but are separated by a hollow space of 10 millimetres, into which steel wedges are driven. The platforms are trapeziform, of sheet iron 4 millimetres (0.157 in.) thick, and supported directly upon the head of the couplings; they are of sufficient size to carry two men at a time, as the experience obtained from the engine at present at work shows that men will travel in pairs although forbidden by regulation to do so. The rods are connected by counterpoise chains passing over rollers placed at intervals of eight platforms. The connections for these as well as those of the hand staples and other fittings of all kinds are made by overlapping pieces, so as not to weaken the rods by screw holes or other perforations. The following are the leading dimensions adopted in designing the work:—

Length of rod between platform .....	7.586 met.
" " stroke .....	3.793 "
Weight of a platform .....	40 kilogrammes
" " pair of counterbalance chains, 130 "	"
" " a catch-piece .....	56 "
" " a guide .....	25 "
" " a man .....	70 "

Maximum load 8 kilogrammes per millimetre, or about one-eighth of the breaking strain.

Every section of four rods is provided either with a catch-piece or a pair of balance chains, and below 500 metres with a guide, to prevent lateral oscillation. The additional weight due to the couplings is about 10 per cent. of that of the rods. The total weight upon the pins by which the rod is attached to the bell crank or quadrant is, when the former is fully loaded with men, rather more than 56½ tons, made up of the following items:—

One line of 10.0 metres of rods .....	29.711
Sixteen connecting chains .....	2.080
Sixteen catch-pieces .....	0.996
Seventeen guides .....	0.425
One hundred and thirty platforms .....	5.200=38.412
Two hundred and sixty men .....	18.200

Total .....

The weight of the entire engine (both rods) when not loaded with men is 76.824 tons. The bell cranks are made with arms of unequal length, 4.740 metres and 3.950 metres, to avoid the use of an excessively long crank; they are of a box construction in sheet-iron, with cast-iron bosses for the shaft and connecting pins, and weigh 6.4 tons each; the connecting rods are of steel. The motive power is furnished by a horizontal steam-engine of 560 millimetres (22 in.) diameter of cylinder, and 1.110-metre (43.7 in. stroke, working with variable expansion.

— By V. MAYER: Oesterreichische Zeitschrift für Berg- und Hüttenwesen.

#### STOPPING AND RE-STARTING TRAM CARS.

An official trial of Brailsford's tram car stopping and re-starting apparatus took place on Blackheath Hill a few days since. The apparatus consists of a couple of clutch bevel pinions upon the axle of an ordinary pair of car wheels, the teeth of the pinions facing each other, and the pinions having in connection with them a horizontal bevel wheel, which is always in gear. This wheel is in a piece, with a drum on which a chain can be wound from either side, according to the direction of travel of the vehicle. The chain is attached to a rod leading from a saddle plate, which is free to slide upon two hollow bars or tubes to compress helical springs which are upon them. The clutch pinions are fitted loosely upon the axle, and these can be caused to turn by clutch boxes which are keyed upon the axle, when a lever, which is within reach of the driver, is acted upon in the proper direction by him. A lever is fitted at each end of the vehicle to suit the two clutch boxes, and these are connected by a transverse tie bar, so that the release of the clutch from either end can take place when desired. The transverse tie bar is attached by rods to foot plates—one at each end of the vehicle—so that the apparatus can be released by the conductor at the tail of the car, or by the driver at the head or front as occasion may require.

The purposes of Mr. Brailsford's system are—To dispense with the existing brakes upon the treads or peripheries of the wheels, these having been found very injurious from the presence of grit and dirt which get licked up from the rails when the wheels are running; to enable the car to establish and control its own brake power, and this in proportion to the weight carried; to remove the excessive labour and strain now exerted by the driver when the brakes have to be put on; to dispense with the hand labour of the driver in taking the brakes off; to give the driver better opportunities to attend to his horses in the stopping and re-starting motions; to enable the conductor to re-start a car instead of whistling or signalling by the gong to the driver, as is now done; to entirely dispense with horse labour in re-starting a car; and to expedite the journey by the facilities offered for continuing the motion when a supposed passenger does not get in. The short life of a horse in tram car work necessitates some such system as Mr. Brailsford's being adopted. The irritation of temper from the sudden and constant pulling up of a high spirited horse has beyond all doubt a detrimental influence upon its health. The strain upon the muscles and spine of a horse upon re-starting a tram car produces in a short time spinal paralysis, from which it never recovers.

In the trials in question the apparatus worked remarkably well. Several stoppages took place on a portion of the level road at Greenwich, and a propulsion from the apparatus alone moved the car the distance of about 23 ft. on each occasion, the horses then taking the pull of the vehicle. The most interesting trials, however, took place on Blackheath Hill, the steepest in London on which tram rails are laid. There the apparatus pushed the car the distance of 10 ft. after each stoppage while going up the hill, and about 12 to 14 ft. going down it, thereby proving the efficacy of the invention, and its adaptability for all districts. The horses, although from an ordinary car, it was evident soon adapted themselves to the change, because, in the first two or three trials, when the signal was given to go on they applied their feet to the ground for the usual tug to move the car, but they found that the car, which was already moving towards them, did not necessitate it. The invention is to be fitted to a regular traffic car, and no doubt the officials and the public will appreciate it to such an extent that all the tram car companies throughout the country will adopt it. Mr. J. H. Betteley, of City Chambers, Fenchurch-street, is the engineer to Mr. Brailsford, and under his guidance the above trials were conducted.

NEW UNICYCLE.—A single wheel, wherein is arranged a seat for the traveller who is to propel it, has been invented by Mr. J. HERONEMUS, of Emdrup, near Copenhagen. The wheel has one central rim, and to this are fixed the arms, which are (say) six or eight in number, half of them swelled, extended, or belled out to one side, and half of them similarly to the other side, each set of arms being fixed to a nave or boss; these arms are bent out so far and the naves are so far apart that the traveller when in the sitting posture finds room in the wheel between them. The arms are by preference not arranged opposite to one another on the two sides but intermediately. The naves carry each a crank, and these cranks are by connecting rods jointed to two bell-crank levers having one arm placed about upright in a position convenient to the traveller to take hold of for working them backwards and forward alternately. Each bell-crank lever has its fulcrum in the seat for the traveller, which seat is hung from the naves or axes of the wheel. The seat is by preference made in scroll form, of light open worked steel plate or wirework, or partly so, and may have a part extending overhead to carry an awning to protect against dirt thrown up, and against rain. From each nave there may be hung a leg serving to steady the velocipede while entering the same, but which can be thrown up out of the way when travelling. The wheel, arms, and the rim may be fitted with stiffeners or diagonals to distribute the weight or strain over the rim as much as possible. The velocipede may be 8 ft. and upwards in diameter, and by this and by the fact-

\* From JAMES FORREST'S "Abstracts of Papers in Foreign Transactions and Periodicals," for the Proceedings of the Institution of Civil Engineers.



lity for working it a very great speed is attained, and with safety to the traveller.

### WATSON BROTHERS' MINING CIRCULAR.

WATSON BROTHERS,  
MINEOWNERS, STOCK AND SHARE DEALERS, &c.  
1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

Ten years ago the weekly information which had previously been published for a great number of years in *WATSON BROTHERS' Mining Circular* was transferred to the columns of the *Mining Journal*, with the following announcement; which is now reproduced in consequence of the numerous letters and enquiries handed to them of late in reply to one which appeared in the *Journal* on the Clementina Mine.

In the year 1843, when mining was almost unknown to the general public attention was first called to its advantages, when properly conducted, in the "Compendium of British Mining," commenced in 1837, and published in 1843, by Mr. WATSON, F.G.S., author of "Gleanings among Mines and Miners," "Records of Ancient Mining," "Cornish Notes" (first series, 1852), "Cornish Notes" (second series, 1863), "The Progress of Mining," with Statistics of the Mining Interest, annually for 21 years, &c. In the Compendium, published in 1843, Mr. WATSON was the first to recommend the system of a "division of small risks in several mines, ensuring the success in the aggregate," and Messrs. WATSON BROTHERS have always a selected list on hand. Perhaps at no former period in the annals of mining has there been more peculiar need of honest and experienced advice in regard to mines and sharedealing than there is at present; and from the lengthened experience of Messrs. WATSON BROTHERS they are emboldened to offer, thus publicly, their best services and advice to all connected with mines and mining.

Messrs. WATSON BROTHERS are daily asked their opinion of particular mines, as well as to recommend mines to invest or speculate in, and they give their advice and recommend mines to the best of their judgment and ability, founded on the best practical advice they can obtain from the mining districts, but they will not be held responsible, nor subject to blame, if results do not always equal the expectations they may have held out in a property so fluctuating as mining.

The great extension of mining business, the difficulty so often complained of by country shareholders in getting accurate and disinterested information as to the state of Cornish and Foreign Mines, and of the financial and real position of mining companies generally, have induced Messrs. WATSON BROTHERS to make their Circular now published in the *Mining Journal* more extensively known, and to state—

That they issue daily to clients and others who apply for it a Price List (as supplied to most of the London and country papers), giving the closing prices of Mining Shares up to Four o'clock.

They also buy and sell shares for immediate cash or for the usual fortnightly settlement in all Mines dealt in on the Mining and Stock Exchanges, at the close market prices of the day, free of all charges for commission. They deal also, on the same terms, in the Public Funds, Railways, Telegraphs, and all other Securities dealt in upon the Stock Exchange.

Having agents in all the mining districts, they are constantly getting mines inspected for their own guidance, and will also obtain special reports of any particular mine for their clients, for the inspecting agent's fee of £2 2s.

**NEW ROSEWARNE (Tin and Copper Mine).**—At the last meeting in London a call of 5s. per share was made, and this, with the machinery on the mine, which cost thousands of pounds, was considered sufficient to pay all debts, and to give a return to the shareholders. Machinery, however, became almost unsaleable, and not one-fourth of its cost could be obtained. Then the principal creditor petitioned the Stannaries Court to wind up the company, the final liquidation has ensued, and there is to be a call of 1s. 2s. per share upon the contributors, and we are sorry to say we are among the largest holders. This call will come hard upon some shareholders, and we are doing our best to get it divided into three instalments extending over several months, and as the only creditors have no objection to this proposal we have reason to believe that an application to the Court will obtain this concession. We would suggest one-third down, one-third in three months, and the balance in six months.

**WHEAL AGAR.**—The finest specimens of tin we have ever seen have been broken from the 205 level, where the lode is valued at 80s. per fathom. The same lode has just been cut in the 215. A specimen of the tin may be seen here before it is sent to a museum.

**CLEMENTINA.**—The great wheel is only waiting shipment, and everything is ready for it at the mine. We have always expressed the greatest opinion of this mine, and believe it will come into early profits. After paying for the large wheel and erecting it the company have a balance of unexpended capital of more than 2000l. There are 5120 shares, 1s. paid up, and limited.

**NORTH HENDRE.**—We have not time this week to refer fully to the accounts sent us.

**PANT-Y-MWYN.**—We would at all times write in terms of praise rather than of censure. Our object is, as it has ever been, to support "legitimate mining," and to point out to our readers what we consider to be departures from it. This has been our only motive in the strictures we have made upon the management of Pant-y-Mwyn, and if we say, or have said, more than we originally intended it has been, and is, owing to the way in which such strictures have been met by those who are evidently interested in what we conceive to be grievous mining mistakes. Scarcely a week passes without bringing us fresh information, though not from our original informants; and there is an old, but vulgar, proverb which might be very aptly applied to the anonymous correspondents of the *Mining Journal*, who in their tortuous endeavours to explain or apologise for the management of Pant-y-Mwyn do but confirm our previous statements, and force us into others that make their position worse. But, first, let us pay our respects to the secretary, who signs his name to another of his laconic epistles. He says, "the directors have in no way contributed or recognised any of the statements made for or against the mine." So far granted, for we certainly do not believe that the directors were in any way responsible for the mode (or the price) in which the mine was introduced here; we have never blamed them for that, but we presume the secretary will admit that the directors were alone responsible for the dividend declared in August, and for the accounts which they circulated with their report. The mine belongs to a Liverpool company, and the first things we heard about it in London were the declaration of a dividend, the most extravagant reports as to its riches, and that the shares were being introduced here at 5s. per share, or 150,000l. for the mine, supposing all the shares were issued. A copy of the accounts issued by the directors was forwarded to us, and they were given in the city article for Aug. 24. In these accounts credit is taken for "lead in stock" on June 30 (that is, unsold) 1116l. 5s., and a dividend of 2s. per share declared, leaving a balance (on paper) of 323l.

Other information flowed in upon us, and we learned that the mine that we and others were invited to purchase at the rate of 150,000l. was without doubt a first-rate property, but that—

- 1.—The dividend had been, as it seemed to us, declared out of un-realised profits.\*
- 2.—Its great riches were under water.
- 3.—The leases had not been taken up.

Would we, who write for the public, have been justified in withholding all this? But we are now told our agent is entirely mistaken in his estimate of the mine and its machinery, and that we are deceived by him. Let us observe, however, that we have not yet even published his remarks. In the month of September a report was handed to us from a gentleman who had just inspected the mine. He is a stranger to us personally, but he knows more about the district than anyone connected with the management of Pant-y-Mwyn, and the substance of his report was given in the *Journal* for Oct. 5 (page 1092), as follows:—"The present company," he said, by the assistance of a small engine are enabled to get a few yards below (the adit), and have opened a rich run of ore for a considerable distance, from which they are breaking about 60 tons monthly, weather permitting. The best ore is under water, and their machinery is totally inadequate to cope with it." The writer went on to estimate the amount required to erect proper machinery at 20,000l. to 30,000l., but we struck out these figures from our remarks after they were in type, not wishing to give unnecessary alarm. After this we sent our agent; he confirmed the inefficiency of the machinery, spoke well of the mine, but condemned the mode of working it, which consisted in "digging after pockets of ore," and not

of a regular system of mining. In this way 50 men (as he was told) were employed, and at a cost, "Aristotle" would have us believe, of 200l. a month!

Having thus cleared the ground as to our motives, and as to what we have already said, let us turn to the last edition of "Aristotle." He now thinks or admits it would be difficult to estimate the reserves of ore existing and at present working; but "a succession of deeper levels will, no doubt, open out immense reserves." Again, "when the engine is erected to cope with any water that may break out, this mine will, without doubt, be one of the most valuable and prolific in Wales." Do not these two sentences express about all that we have said of the mine itself, and acknowledge the correctness of all we have written in regard to the present mode of working it? We shall be sorry, if, in conclusion, we are touching "Aristotle" on the "raw" if we again refer to the issue of shares at 10s. discount, and which it surprises him so much we should ever notice. He says we should bear in mind those shares were issued prior to the great discovery of lead being made, but in a circular before us the date of issue for such shares was in December, 1877, and a dividend was declared, we believe, in two months.

**SATURDAY, OCT. 26.**—Market quiet, and prices nominal. Van, 15 to 16; Great Laxey, 15 to 16; Roman Gravel, 6 to 6½; Tankerville, 3½ to 3¾; Pateley Bridge, 3½ to 4; Carn Brea, 3½ to 3¾; Dolcoath, 23 to 25; South Condor, 10 to 10½; South Franches, 4½ to 5; Tincroft, 8 to 9; Agar, 3½ to 4; Grenville, 2 to 2½; Peavor, 6 to 6½.

**MONDAY, OCT. 28.**—Market again inactive. Aberllyn, 11 to 13; Clementina, 1½ to 1¾; West Tolgus, 40 to 42; East Van, 2½ to 2¾; South Franches, 4½ to 5; Leadhills, 1½ to 1¾; Van, 15 to 16; Agar, 3½ to 4½; Roman Gravel, 6 to 6½; Carn Brea, 3½ to 3¾; Dolcoath, 23 to 25.

**TUESDAY, OCT. 29.**—Market for tin shares active, in consequence of a rise of 2l. in the tin standard. Lead shares are quiet. Carn Brea, 35 to 40; Dolcoath, 23 to 30; South Condor, 10 to 11; South Franches, 4½ to 5; Tincroft, 8 to 9; Agar, 4 to 4½; Grenville, 2 to 2½; Peavor, 6 to 6½; Aberllyn, 11 to 13; East Van, 2½ to 2¾; Great Laxey, 14 to 15½; Leadhills, 1½ to 1¾; Pateley Bridge, 3 to 3½; Roman Gravel, 6 to 6½; Rookhope Lead, 15s. to 12s. 6d.; Tankerville, 3½ to 3¾; Van, 14 to 15; West Cliverton, 15s. to 12s. 6d.; West Tolgus, 40 to 42; Parys Mountain, 4s. to 5s.; Penrith, 3s. to 5s.; Devon Great Consols, 15s. to 25s.

**WEDNESDAY, OCT. 30.**—Market active for tin shares. South Franches, 4½ to 5½; South Condor, 10½ to 10¾; Tincroft, 8 to 9; Carn Brea, 35 to 40; Grenville, 2½ to 2¾; Dolcoath, 25 to 30; Agar, 4 to 4½; Roman Gravel, 6 to 6½; Great Laxey, 14 to 15; Van, 14 to 15; Aberllyn, 11 to 13; Clementina, 1½ to 1¾; Tankerville, 3½ to 3¾; Pateley Bridge, 3 to 3½; East Van, 1½ to 2½; West Cliverton, 10s. to 20s.

**THURSDAY, OCT. 31.**—Market for tin shares very firm, and stock scarce. Dolcoath, 27 to 29; Carn Brea, 35 to 40; South Franches, 4½ to 5½; Grenville, 2½ to 3; Agar, 4 to 4½; Tincroft, 8 to 10; Aberllyn, 11 to 13; Van, 14 to 15; Tankerville, 3½ to 3¾; Roman Gravel, 6 to 6½; Great Laxey, 14 to 15; Pateley Bridge, 3 to 3½.

**FRIDAY, NOV. 1.**—Market closed.

**MR. WILLIAM H. H. WATSON** having had a few years' experience in Practical Engineering and Mining in Cornwall, as well as two years' practice in the London Stock and Share Markets, begs to offer his advice and services to Shareholders and Intending Investors in Mines, and in the Purchase and Sale of Shares.

W. H. H. W. will shortly be in Wales, and will be happy to give his independent opinion of such Mines as he may visit.

W. H. H. W. has had special business placed in his hands in the following shares:—

**SANTA BARBARA** (to buy).  
**PTANQUI** (to sell).  
**SOUTH FRANCES** (to sell).  
**100 HELLFAHLL**.  
**100 MOWA DU** (to sell).  
**25 ARENDAL** (to sell).  
**10 WEST PRUSSIAN** (to sell).  
**10 MONYDD GORDDU** (to sell).  
**LEADHILLS**.  
**20 DEVON GREAT CONS.** (to sell).  
**PENNANT BARYTES** (to sell).  
**MINERA LEAD** (to sell).  
**WYE VALLEY**.

**DERESBY MOUNTAIN**.  
**DERESBY CONSOLS**.  
**ABERLYN**.  
**CLEMENTINA**.  
**R. OKHOPE**.  
**GLENROY**.  
**20 PANT-Y-MWYN** (to sell).  
**20 TANKERVILLE** (to sell).  
**VAN**.  
**EAST VAN**.  
**WHEAL AGAR**.  
**ROMAN GRAVELS** (to sell).

In the Sale and Purchase of Shares advertised cash will be paid and expected on receipt of transfers.

Address: 1, ST. MICHAEL'S ALLEY, CORNHILL,  
LONDON, E.C.

### Meetings of Public Companies.

#### PANULCILLO COPPER COMPANY.

The ordinary general meeting of shareholders was held at the offices of the company, Great St. Helen's, yesterday.

Mr. JOHN PENDER, M.P., in the chair.

Mr. J. S. ALEXANDER (the secretary) read the notice calling the meeting.

The CHAIRMAN, in moving the adoption of the report and accounts, said it was always unpleasant to meet when the directors had not a more satisfactory report to place before the shareholders than they had to-day. The accounts showed a loss instead of a profit; but, dark as the report may appear, there was a good deal of brightness in the accounts, as the economies which had been effected during the year were likely to show. The company was pretty nearly, if not entirely, paying its way, even with the present low price of copper. It would be out of place for him to say anything about the state of trade; everyone knew the depression which pervaded all departments of business, and there was no exception. Every kind of metal was more or less depressed, but they had the satisfaction of knowing that, in consequence of the low prices which were prevailing, many copper mines, particularly in Australia, were being shut up, and things in Cornwall were in a very sorry state indeed. He had at previous meetings said it was a long lane which had no turning, and now that they had effected economies, which had enabled the company to pay its way at the present price, he saw no reason why they should not hope for a much better future for the company. In conclusion, the Chairman formally moved the adoption of the report and accounts.—Mr. F. J. JOHNSTON seconded the resolution, which was put and carried.

On the motion of the CHAIRMAN, seconded by Mr. F. J. JOHNSTON, Mr. Alphonse Henri Berthand was re-elected a director.

On the motion of the CHAIRMAN, seconded by Mr. F. J. JOHNSTON, Mr. Frank W. Bond was re-elected a director.

The CHAIRMAN said he would make one observation. Since he last had the pleasure of addressing the shareholders they had lost one of their directors, Mr. Andrew, who had been a director from the commencement of the company, and whose great practical experience as a smelter had been of great value to the company. His advice was always given readily, and the good common sense which Mr. Andrew always displayed had been most valuable, and although Mr. Andrew was gone the company was to a considerable extent benefiting from the advice which that gentleman gave in bygone days. He (the Chairman) had now the pleasure of proposing—"That a vote of thanks be given to Mr. Heatley for his management of the company in Chili during the past year, with the expression of a hope that still further economies will be effected in the current year, so that more successful results might be presented at the next meeting, and also that the thanks of the meeting be given to the staff for their services during the past year."

Mr. CHARLES JOHNSTON seconded the resolution, which was put and carried.

On the motion of Mr. K. H. JAMES, seconded by Mr. T. K. WEIR, the Auditors, Messrs. Harding, Whinney, and Co., were reappointed.

The CHAIRMAN said that concluded the business of the meeting, and he hoped at the next meeting the directors would be able to present a much more satisfactory state of affairs.

Mr. JAMES said there was one duty which devolved upon the shareholders, and that was to tender a hearty vote of thanks to the board for the way in which they had managed the company's affairs. It was always an arduous task when they had to meet a deficit, but the directors had brought the company through very serious difficulties, and when copper improved in price he hoped they would be able to give the shareholders a dividend, which had been so long expected. There was no doubt that at one time the directors stood between the shareholders and utter collapse, and they evolved a scheme which gave the shareholders a dividend, although not on the shares, but they had debentures, which paid a handsome dividend, and some had been drawn. At any rate, they had re-

ceived more out of the mine than at one time he expected. There was no doubt that at one time the mine would have been shut up but for the trouble taken by the directors, who had worked without remuneration; and although this, perhaps, was scarcely a time to talk of remuneration, still he trusted that one day the profits would enable the directors to remunerate the board.

Mr. T. K. WEIR seconded the resolution. Not only was great credit due to the board, but also to the management in Chili. Speaking from a personal knowledge of the property, he should have said a few years ago that it was impossible for the property to have been brought to its present excellent position. There was, no doubt, that excellent generalship had been shown in the management of the property.—The resolution was put and carried.

The CHAIRMAN, in acknowledging the compliment, said great credit was due to the practical gentlemen sitting around him for the great services they had rendered. He himself was largely interested in the company, and hoped he had done something towards saving it from collapse. It was a labour of duty which was honestly and anxiously carried out by himself and the board. There was no doubt that if they had been able to work Panulcillo as economically some years ago as now the shareholders would have had considerable amounts of dividends in their pockets at the present time.—The meeting then broke up.

#### CWM BRWYN LEAD MINING COMPANY.

The first general meeting (statutory) of shareholders was held at the company's offices, Budge-row, Cannon-street, on Thursday.

Through the unavoidable absence of the Chairman (Mr. J. H. Tilly) that office was unanimously voted to, and ably filled by, Mr. F. H. BARKER, who opened the proceedings by stating that the meeting was held in compliance with the requirements of the Act of Parliament, which enacts that such a meeting shall be held within four months of the registration of the company. There was only business of a very formal character to transact, and he would at once call on the managing director, Mr. George Underwood, to read his report of the proceedings and work, &c., at the mine since it became "the property of the company." After hearing which if the shareholders had any questions to ask he would be very happy to answer them.

Mr. UNDERWOOD said: Gentlemen, in complimenting the shareholders on the possession of the Cwm Brwyn Mine I do so in the very fullest sense of the word, for it is so unlike most mining properties taken to by newly formed companies, it being in a thoroughly developed condition. Sunk down to 104 fms., with level driven east and west every 12 fms., in all of which good ore is obtainable, it is only now necessary to have proper methods of cheaply working the mine—an air-compressor and rock-drills to turn out ore in far larger quantity, an improved skip-way through the shaft to bring the ore more quickly to the dressing-floors, and the erection of improved dressing apparatus to keep pace with the increased production.

During the last three months since this property came into the possession of the company we have been steadily working, and in every level worked the mineral has improved in value. In the 80 I gave instructions to drive forward in the forebore to intersect the body of ore going down from the 56 east; 2 fathoms only have been driven, and evidence appears of its proximity to the fore, for heavy water now flows out of the forebore, and good stones of blende and spar are obtained, proving beyond doubt the close proximity of the lode, and if that should prove as good in this level as it was in the 56, the value of the mine will be very greatly enhanced. We have many fathoms of good work all along this level, and intend to go up to the 56, containing from 2 to 2½ tons of ore per fm., and on which 20 men could be placed to work and stop the ore. Those now working there prove by every shot the improved value of the lode. We have undertaken work in the 92, west of this level, for 6 fms. long, and from 3 tons to 4 tons of ore per fathom, which ought to be driven under from the 104, and so intersect the lode, as is being done with the 80. In the 104, east of shaft, we can put 20 men to work stopping down rich ore for many fathoms in length, yielding from 1 to 1½ ton per fathom, and there is ore gone down in this level 6 to 8 in. wide, and solid. This is the deepest level in the mine. The general features have much improved underground of late, and plenty of working ground is in sight on which from 30 to 40 men could be placed. We have at present 16 tons of ore on the surface, which, when dressed, will be worth about 150l. Our expenses since starting, including water, rent, working materials, wages, &c., have been about 130l., so that even working under our present difficulties we are not working at a loss. When the new machinery is erected and working we shall, I have no hesitation in saying, have one of the very best properties in Wales.

Mr. EVANS JONES WILLIAMS, of Aberystwith, at the conclusion of Mr. Underwood's remarks, fully corroborated all that the managing director had said. He (Mr. Williams) knew the property well, and complimented Mr. Underwood on the very modest tone he had adopted, adding that he might have couched it in even more glowing colours, and still have been quite within the truth. He was sure with a small outlay the mine might be made a very good paying one, even at the present low price of lead. He was happy to congratulate the shareholders on the possession of such a valuable property, and particularly on the entire absence of steam power, or the need for it, throughout the works.

After some remarks from other shareholders present, and a unanimous vote of thanks to the Chairman, the meeting broke up.

[For remainder of Meetings, see to-day's Supplement.]

#### THE TIN TRADE.

	Sept. 30, 1878.	Oct. 31, 1878.	Oct. 31, 1877.	Oct. 31, 1876.
Straits and Australian, spot.....Tons	9,444	9,064	8,989	7,650
Ditto, landing.....Tons	585	235	297	100
Straits afloat.....Tons	150	260	110	350
Australian afloat.....Tons	2,170	1,811	897	1,950
Banca, on warrants.....Tons	1,662	1,240	968	67
Ditto, Trading Co.'s hands.....Tons	925	1,063	880	1,281
Ditto, afloat.....Tons	243	512	394	541
Billiton, spot.....Tons	1,678	1,695	1,680	541
Ditto, afloat.....Tons	975	850	1,800	1,500
Australian tin in Holland.....Tons	425	388	577	745
Total.....Tons	18,227	17,216	15,364	15,216

Deliveries during the month in—

London.....Tons	1,147	1,323	1,071	922
Ditto, Holland.....Tons	528	626	689	594

Total.....Tons 1,675 1,949 1,760 1,516

Also 140 tons overside to America.

Shipments from Straits in October.....Tons 210

ditto Australia in October.....Tons 450

Estimated, owing to interruption of cable.

Shipments from Australia in Sept. were 600, instead of 800 tons.

During 12 months During 10 During 10

ending Oct. 31, '78, months, '78, months, '77.

Shipments from Straits to London.....Tons 3,431 2,740 2,580

Shipments from Australia to London.....Tons 9,845 7,315 6,566

Deliveries of foreign tin in London.....Tons 11,755 10,439 8,919

London, October 31. A. STRAUS AND CO.

Our tin market continued very flat during the first half of this month, prices declining another 1l., and everything seemed to indicate a further fall, when, on the contrary, the same was all of a sudden stemmed by rather wild operations both here and in London. Notwithstanding very considerable buying, a material advance has been established, and we have to report a rise of no less than 4l. from the lowest point. Holders may be fairly congratulated on this unexpected change in their favour, and we would advise them to avail themselves of it. Banca was slow of sales at the beginning of the month, and the price declined from 35½ fl. to 34 fl. The speculative movement that has since set in has driven the price up to 33½ fl., which is our closing quotation. Contracts for delivery ex November and ex January sale changed hands from 34½ fl. to 33½ fl. This year's last sale will be held towards the end of November. Billiton fell rapidly from 34 fl. to 33 fl., the lowest point touched. With continued large sales at 33½ fl. speculators, an advance of 4½ fl. has been effected. There are no sellers at 33½ fl. 4l. from the lowest point. Holders may be fairly congratulated on the 14th instant fetched the average price of 37½ fl., costing to sell here about 33½ fl. by steamer. Next sale comprising the same quantity will be held on Monday Dec. 9. The position of Banca tin in Holland on Oct. 31, according to the official returns of the Dutch Trading Company, was:—

Import in October.....Slabs	4,336	1,381	1,875	6,894
Total ten months.....Tons	110,479	119,678	121,177	116,143
Deliveries in October.....Tons	12,492	12,352	12,352	11,143
Total ten months.....Tons	106,753	107,326	108,825	105,000
Stock second hand.....Tons	38,571	39,083	40,390	44,809
Unsold stock.....Tons	25,584	29,054	29,054	29,054
Total stock.....Tons	75,255	68,037	69,444	73,863
Afloat.....Tons	8,200	6,300	6,300	2,589

Statement of Billiton:—

Import in October.....Slabs	7,300	4,442	8,210	82,089
Total ten months.....Tons	95,023	85,136	141,181	141,181
Deliveries in October.....Tons	7,862	9,584	88,239	88,239
Total ten months.....Tons	77,569	80,190	33,229	33,229
Stock.....Tons	19,000	18,000	18,000	18,000
Afloat.....Tons	19,000	18,000	18,000	18,000
Quotation 1 Banca.....fl.	37	42	42	42
Oct. 31 Billiton.....fl.	37	42	42	42

These combined returns of Banca and Billiton for 1878, compared with those for 1877, exhibit—An increase of the import for October of 182 tons; a decrease of the import for the ten months of 41 tons; a decrease of the deliveries for October of 34 tons; a decrease of the deliveries for the ten months of 20 tons; an increase of the stock second hand of 567 tons; an increase of the unsold stock of 204 tons; an increase of the total stock of 871 tons; a decline of the quotation of Banca of 7l. 10s. per ton. The Government Returns for the month of August are—

\* The accounts were made up to June 30, and as the sales of lead ore are not published in the *Mining Journal* we do not know when the ore credited as "in stock" was sold. It would be as well if the sales were sent to the *Journal* as other companies send them, and to clear up matters let the sales of Pant-y-Mwyn be given from June 30 to present time.



## EXPORT OF TIN FROM HOLLAND.

	July.	Eight months.	1878.	1877.	1876.
Germany.....Tons	304	345	481	337	237
Belgium.....	48	10	7	121	301
France.....	118	185	332	1005	1158
Hamburg.....	55	55	74	286	469
United States.....	45	58	66	438	342
Other countries.....	63	64	73	347	352
Total.....	630	719	1011	4534	4987

Rotterdam, October 31. EBELENG AND HAVELAAR.

## THE ELECTRIC LIGHT.

In connection with the development of the principle of electric illumination nothing of any practical importance has been added to the stock of published knowledge during the week, but a trial of Mr. Richard Werdermann's method of producing the light has been made, and a two-horse power engine working a small Gramme machine was found to be capable of maintaining two lamps with a steady light, but this is practically no advance upon what has been done previously. As to the assertions of the inventor as to what he could have done had his lamps been ready, they must, of course, be taken for what they are worth, considering that he afforded no evidence that the engine was not yielding more than two-horse power actually, which is merely the old and prohibitory rate of one-horse power per lamp. There is still the great difficulty with regard to all the systems of electric lighting which have attracted so much attention during the last two or three years, that those which are successful are wanting in novelty, and those which are novel are unsuccessful, or at least are no improvements on their predecessors. It may likewise be said that most of the inventors enshroud their discoveries in far more mystery than would be necessary where there anything really valuable in them. So far as can yet be ascertained with regard to Mr. Werdermann's arrangement, there is no practical advance upon that of Charles Weightman Harrison brought forward many years ago; indeed, it is questionable whether the substitution of mercury for the fragile carbon rod proposed by Werdermann for maintaining electric connection with the disc was not the better of the two, for though Harrison's arrangement was somewhat inconvenient, Mr. Werdermann's notion of using a delicate rod,  $\frac{1}{4}$  in. diameter and 1 yard long, of a material extremely brittle, can scarcely be hoped to succeed.

The inconvenience of long rods when subject to the action of heat was experienced in the lime light contrivance of William Prosser, although in that case the rod was fully  $\frac{1}{4}$  inch thick, and was provided with a protecting guide to prevent fracture; the material, moreover, being far less brittle than the carbon rods used in the Werdermann arrangement, and although it is true that Werdermann has a string and counterbalance weight to pull it up to its work, it will be obvious that such an arrangement would be quite worthless in the case, which would constantly recur in practice, of breakage of the carbon rod where such breakage occurs at no more than  $\frac{1}{4}$  in. from the disc. The very description of the Werdermann lamp would suffice to condemn it—a long slender rod of carbon, of the dimensions stated, secured in a vertical position, and pointed at the upper extremity, impinges against the flat side of a carbon disc. The upper part only of the rod is in the circuit, and the length of this portion can be varied by shifting the transmission collar. The upper extremity of the rod is kept constantly in contact with the disc by the string and counterbalance weight already mentioned. The rod, of course, retains its pointed form, whilst diminished by combustion only, but the fracture of the rod upsets the arrangement altogether. The disc is, as every electrician would expect, wasted very slowly, the combustion being chiefly confined to the rod, which is precisely the most difficult to keep in order. By arranging 10 lamps near to each other they were made to emit light simultaneously, but neither the lights themselves nor the position in which they were produced were of a character that could by any chance come into use in practice. The advantage claimed for the Werdermann lamps is that a current large in quantity, but of low intensity, can be used; whether this claim can be substantiated can be better determined after the public exhibition, which is promised in a few days.

## TREATMENT OF COPPER PYRITES.

The ordinary process for the treatment of cupreous pyrites rich in iron and sulphur, and containing but little silica, is to crush them to coarse powder mixed with salt, roast them in close or other furnaces, lixiviate the mass with hot water and weak acid, and then precipitate the copper from the solution with iron. This process is attended by the disadvantage that the ore has to be so finely crushed, in order to extract the copper, as to render the said ore unfit to be subsequently smelted into iron in blast-furnaces, and, consequently, the general practice is to use the said ores simply for settling iron furnaces. The objects of the invention of Messrs. H. and C. H. HILLS, of Tynemouth, are to render a considerable portion of the oxide of iron residue obtained in the treatment of the pyrites available for reduction to metallic iron in blast-furnaces to make the remainder into the ordinary settling ore, known as "purple ore," and also to extract from the ores the copper contained therein, together with the silver and gold, when that metal is also present. The cupreous pyrites, after having been calcined and deprived of the greater part of its sulphur in the manufacture of sulphuric acid or for other purposes, may first be screened to separate the portion of the ore which is small enough for the purpose of the process, hereinafter described, and the larger pieces may be passed through suitable crushing machines and screens (or the ore may be passed direct through the crushing machines without previous screening), the mesh of the screens or the size of the apertures therein being from a quarter to three-quarters of an inch, according to the character of the ore to be treated, and the ore that has been taken in its calcination. The ore so crushed is by preference passed over a screen of fine mesh or perforation to separate the smallest particles or dust, such mesh being of the sizes usually employed for preparing cupreous ores for the chloridising process, and the ore which passes through such mesh may be treated in calcining or chloridising furnaces, either alone or in admixture with coarser portions of the ore after the lixiviation of the latter for subsequent treatment. The dust portion of the ore screened out will contain lower percentages of copper and sulphur than the original bulk of the calcined cupreous pyrites contained. The chloridising of this portion of the ore is consequently easier.

The remainder of the ore is by preference carried forward into suitable filter-vats, and lixiviated with weak muriatic or sulphuric acid and water, used hot by preference, or with hot water alone, and the liquors so obtained are run into vats containing iron for the precipitation in the usual manner of the copper held in solution. The ore thus deprived of the soluble salts of copper and iron is to be classified and dressed by jigging or other suitable water-dressing machinery for the purpose of separating by gravity the bulk of the kernel copper formed in calcination and the unburnt sulphides of copper and iron from the rest of the ore, which may be either smelted into regulus copper or recalcined as at first; and this applies more especially to the larger-sized portion of the ore crushed and screened out, as described. It is not essential for the working of the invention that any of the crushed ore, which is sufficiently small to chloridise in the ordinary way, should be passed through the water-dressing process, but only the coarser sizes which are available for smelting to iron, but in all cases it facilitates the extraction of copper. The first lixiviation may also be dispensed with, and the crushed ore be dressed after passing the crushing machines and classifying sieves, the liquors used for the dressing process being drawn off from time to time into copper precipitating vats and replaced by fresh water.

The lightest part of the ore (principally oxides, which form the greater portion of the ore) which passes away from the dressing machine is then to be conveyed to suitable furnaces, and either roasted to oxidise the sulphides and sub-salts which remain, or mixed with salt and chloridised. The ore is then passed again into the filter vats and lixiviated with hot water and a sufficient

quantity of weak acids to dissolve out the remaining copper. If the ore is oxidised in the furnaces, and it contains silver and gold, or either, the said ore may, after the copper is washed out, be mixed with a small quantity of salt or brine, and be again passed rapidly through furnaces to chloridise the precious metal or metals, which can then be lixiviated out, and be precipitated by iron, together with the small quantity of copper that is left in the ore from the first lixiviations, or be precipitated by other suitable precipitants, and the precipitate obtained therefrom may be treated for the precious metals by any suitable method. Or if this ore has been chloridised the precious metals can be recovered by Claudet's iodide process, or by any other available process.

After passing the classifying screens and dressing machinery the different sizes of ore so classified may be kept and treated separately or together; but the larger sizes of the crushed ore, which it is one of the chief objects of this process to obtain (and which cannot be obtained by the chloridising process, as it is at present conducted for this class of calcined cupreous pyrites, owing to the small size of crush which is found necessary for the complete extraction of the copper), are available as iron ore for reduction to iron in blast-furnaces while the remainder, consisting of small lumps and powder, can be used as settling ore or for other purposes. The proportion of the larger sizes obtained by this process will vary from 20 to 50 per cent. of the whole, according to the nature of the ore and the size of the screens used, and will be of much higher value than the ordinary "purple ore" as at present prepared, which is crushed too small to be economically utilised in blast-furnaces. The kernel copper and unburnt portions of the ore separated by the dressing process will be rich in copper, and contain from about 5 to 20 per cent. of this metal, varying according to the percentages contained in the raw mineral. This portion of the ore may be divided into two or more qualities. The richest in copper may be smelted for that metal direct, as hereinbefore stated, and the part containing the least copper ore may be recalcined in suitable furnaces for the manufacture of sulphuric acid, or be roughly calcined in open furnaces, and then passed again through the original process.

## FOREIGN MINES.

**RICHMOND CONSOLIDATED.**—The directors have declared a dividend of 10s. per share, payable on Nov. 5, at the Union Bank of London.

**ST. JOHN DEL REY.**—Telegram from Morro Velho, dated Rio de Janeiro, Oct. 29: Produce eleven days, second division of October, 13,500 ozt.; yield, 67 ozt. per ton = 84 ozt. per ton by old measurement.

**PITANGUI (Gold).**—Mr. T. S. Treloar (Pitangui, Sept. 16 and 23) reports that a line of soft blue clay was met with in the early part of August, which let out a good quantity of water, and was very troublesome for handling. On August 17 the yellow pizarra was again cut into, and the contact with the clay of that month, the total length driven in the adit during August being 4 fms. 4 ft. Since the end of August so much water was issuing from the right hand side of the end of the adit, and the pizarra was in consequence so heavy that no timber the miners can put in would stand, therefore it had become necessary to suspend operations in the end for the present, and commence driving about 4 fms. back from the end a side eye, or small duplicate level, to cut off the water from the main level. This small side level was commenced on Sept. 16, and was progressing satisfactorily, and it was hoped that it would be abreast with the adit end in the course of ten days time. The driving of the main level would then be resumed without delay, and the appearance of the jacutinga might be looked for very soon, as the fact of so much water having lately been cut is an indication that the lode is close at hand. Total length of a lift driven to August 31, 139 fms. 4 ft. The shaft continued under suspension until there was a change for the better in the adit.

**SANTA BARBARA (Gold).**—Mr. Hilcke (Pari, Sept. 26) reports that the lode wrought upon so far during the month of September was looking fully as well as in August, from which an equally favourable produce to that month might be expected. All going on well at the establishment.

**BIRDSEYE CREEK.**—Telegram from Mr. G. S. Powers: The result of the last clean up of the season is a gross return of \$16,500. I send you a remittance of \$8000.

**RICHMOND.**—R. Rickard, Oct. 7: I am glad to be able to say that the ore body at the 500 is developing very well, and the ore passed through the last week is of good quality; the place we have been working the last week is drifting from the rise in the back of the south drift from the incline. The top of this rise is about on a level with the 500 drift on fissure, and according to the present indications, we ought to strike it soon on that level, which we are drifting with the Burleigh drill. The relative position of this rise to the 500 ft. level is the same as shown by the accompanying rough sketch. The 600 ft. level is being drifted by the Burleigh rock-drill, which is doing good duty. The compressing machine is working very well. The second day after we started the exhaust got out of order, which was soon put in repair, and since it has been working very smoothly. We are pushing on the reconstruction as fast as possible. All the material for the building of the house is ordered, and the plans for iron work for the furnaces will be forwarded to San Francisco to-morrow. I am having plan of the building prepared to forward to you. They will be finished by the end of the week.

**R. Rickard, Oct. 9:** Since my last explorations in the mine have been carried on with great vigour, and with very good results. The 400 drift in the same character of rock as last reported, being of the contact of quartzite and limestone, is very favourable ground for drifting. The winze below No. 7 chamber is holed to the 500, which will enable us to start much more economically than we have been able to do for some time past. The drifting of the 500 on fissure has been resumed; we are working a drift on this drift, which will be the means of exploring more rapidly, the present end is in good ground for drifting, and favourable looking for ore. A drift has been started north from No. 1 winze on fissure on the 500 level; the ground is favourable for drifting; this drift we are working with the Burleigh drill. No. 2 winze is down 50 ft., the bottom is in limestone; this winze has been started on an incline regardless of the ore to connect with the 600, which is drifted for ventilation and ore shaft. From top of No. 2 rise, 30 ft. above south drift from the 500, a drift has been driven 40 ft. in good still high grade ore. The present end of this work is 20 ft. above the 500, thereby clearly showing that the ore is making up strong and good. No. 3 winze has been abandoned for the time being for lack of air; this ground will be explored from the 600. The 600 on quartzite is without change; the ground is still favourable for drifting. The 600 main drift west is looking very favourable for ore; the present end is in limestone, with seams of red stained lime. A cross cut has been started from the end of this drift to connect with No. 2 winze being sunk below the 500. The 800 is being dredged on the contact of quartzite and limestone; ground favourable. The drifting of the 800 west has been suspended for the past few days, but will be resumed with the Burleigh as soon as we can get the pipes in, which will be in the course of two or three days. We are pushing on the reconstruction of the smelting works as fast as possible, and if we are not retarded in getting material ordered from San Francisco and elsewhere we shall be ready for smelting by Dec. 1.

\* \* The engraving of the sections to illustrate the Richmond report not being finished at the time of going to press, we are compelled to defer them until next week.

**FRONTINO AND BOLIVIA (Gold).**—The directors have received advices from their agents, dated Sept. 12, accompanied by a remittance valued at 2800l. The accounts for August show: 970 tons treated produced 742 ozt. of gold, or an average of 4 dwts. per ton; 450 ozt. of gold dust brought from miners on tribute, of the 900 west has been suspended for the past few days, but will be resumed with the Burleigh as soon as we can get the pipes in, which will be in the course of two or three days. We are pushing on the reconstruction of the smelting works as fast as possible, and if we are not retarded in getting material ordered from San Francisco and elsewhere we shall be ready for smelting by Dec. 1.

\* \* The engraving of the sections to illustrate the Richmond report not being finished at the time of going to press, we are compelled to defer them until next week.

**ANTIOQUIA (FRONTINO).**—The directors have received advices from their agents, dated Sept. 12, accompanied by a remittance of gold valued at 284l. The accounts for August show: 44½ tons of gold dust, which produced 91 ozt. of gold, or an average of 2½ dwts. per ton; value, 284l. Cost at the mines, and in London and Medellin, 313l. 10s.; loss, 49l. 10s. In addition to the monthly cost of 313l. 10s., the sum of 133l. 10s. has been spent on capital account.

**TOLIMA.**—Oct. 28: Frias: August returns, \$20,921 7½; cost, \$9523 1½; profit, \$11,398 5½; equal in sterling to 1899l. 15s. 9d. The management reports 214 70 fms. of ground expended, of which 55 50 were unproductive, leaving 159 20 of productive ground. Satisfactory as is the progress shown by the above returns, still better results would have been attained save for the drought which has continued to prevail during the past month (August), the superintendent stating that it induced serious delay, both underground and at the surface. The underground agent reports:—Engine shaft: Sunk 4 ft. 3 in. Two weeks' work were lost by reason of the water lying in the mine. The bottom is looking kindly to give mineral soon, a string of ore about 1 in. in width having formed in the footwall, and giving every appearance of our being on the top of a course of mineral. Scarcely any progress has been made in the 40 east owing to our inability to keep the mine dry during the dry season, when the water-power becomes inadequate to work the pumps to their maximum capacity. The 40 fm. level on Welton's lode has been driven 4 ft. 6 in.; the lode not having improved the trial is suspended for the present. From the slope in the back of the 40 60 ft. 2 in. has been extracted; the vein is at present 3 in. wide, mostly blende; estimated yield 20 owt. of 250 owt. mineral per fathom. Set to six men at 27 4 ft. The winze in the 30 has been sunk 8 ft. 7 in.; vein on hanging wall 10 in. wide, containing lead, blende, and native silver; on the footwall there is 6 in. of lead and native silver, which will give over 1000 owt. per fathom; set to 13 men at \$150. The lode in the slopes in the bottom of the 30 is from 7 to 12 ft. wide; average width of solid ore, 8 in.; assumed yield, 33 owt. of 265 owt. per ton. During the month 45 ft. 2 in. were stopped; set to two contractors at \$22 and \$20 per fathom. Esperanza: 12 ft. have been taken out; rich ore appears to be making again on the footwall; 2 ft. from the bottom the vein is very thin. In the bottom it is fully 3 in. wide, containing lead, quartz, and red silver. In the end the lode is about 10 in. wide, and is good stuff for crushing. The 30 fm. Back Slopes: 44 ft. extracted; ore in high back completely worked out as far east as Esperanza shaft. In the west end there is a large vein of poor quality blende. The 25 fm. end is driven 4 ft. 4 in., and is improving. There is a vein of ore 2 in. wide up and down the breast that will give 6 owt. of 250 owt. stuff per fathom; let to two men, at \$20 per fathom. The 20 fm. east is driven 5 ft. 4 in.; a great improvement has taken place in this end. During the last few days the lode has opened out to 3 ft. wide, most of it pick ground, and showing a face of blende ore on the footwall. This looks as if it was getting near a bunch of ore. The 20 west has advanced 12 70; no improvement to report; still shows quartz and a little pyrites. The 20 (Welton's) has advanced 11 ft. Vein on footwall improving in size and quality; it is over 12 in. wide, containing lead, blende, and decomposed pyrites, and gives

promise of getting into a good run of ore soon.—Alto Gold Mine: We have had a clean up at the workings I referred to in my last report, situated to the south of the old run. The result of 14 days labour by 7 peons was 34 ozt. 7 dwts. 13 gr. of amalgam, or approximately about 15 ozt. of gold (area of bed rock about 784 square feet), and as the clint has an encouraging appearance, I have hopes of better results than our recent washings at the S.W. mine has yielded. The cost for the month amounts to \$175 3¼ c., but this includes occasional runs at the hydrant when water permits.

**KAPANGA.**—James Thomas, Sept. 16: During the past month the following work has been done:—Coromandel Shute: In the 60, about 10 fms. south of pump-wine, I put a pair of men to sink and stop the bottom; they have sunk 3 fms. deep and 2 fms. long, carrying down a strong lode, consisting of quartz, which is very much intermixed with this crystalline mud and antimony—the great indications for producing gold. Some excellent specimens of gold quartz in a good crushing stuff have been obtained. The south stop, above this level, has been stopped 4 fms. long and 2 fms. high; some rich specimens have also been obtained here. The lode is looking well, and is full of minerals, the same as seen in the sinking below.—Albion Shute: The back above the 50 has been stopped south from the end 4 fms. long and 3 fms. high; the lode has been squeezed, and it is now 20 in. wide, composed of kindly quartz, full of mineral, carrying a gold-bearing floccan on the hanging wall; small spots of gold occasionally seen, but no special men has been obtained here this month.—Canter Leader: At a distance of 12 fms. north of the main cross-cut, in the 50, I put a pair of men to prospect a strong canter leader running in an easterly direction; they have driven 3 fms. through very wet, soft country; the branch is 1 ft. wide, having the best indications for producing goldstone.—Crushing: The return from crushing is as follows:—From the 60, 12 tons of general lode stuff yielded 12 ozt.; specimens 50 lbs. yielded 89 ozt. From the south stop 12 tons gave 10 ozt.; specimens 20 lbs. for 19 ozt. The 50 crushed 18 tons for 5 ozt. Quartz crushed 40 tons; specimens 70 lbs. total yield, 85 ozt. melted gold.

**MALABAR.**—G. R. O'Reilly, Sept. 19: We made a clean up of our upper and lower sluice, finishing yesterday. The result of 500 hours run, of which a large proportion was on pipe-clay, is a bar of the value of \$1447 82, which shows some improvement on the results obtained in previous runs. About \$100 may be estimated as still remaining in tail sluice and undercurrent. During the run we have advanced the monitors twice, and the latter half of the time was on the best looking ground we have. The gravel, however, is by no means rich, but if we were unobstructed by pipe-clay it would give a very much better result. The main lode is not well defined, if it exists at all, which I rather doubt. The bed-rock is almost barren of gold, and adds but little to our returns, and a streak of gravel in immediate contact with it is also very poor, consisting of a dry sandy gravel with small stones. The water will be turned on again to night, and I anticipate that the present run will give a better result than the last one, but at the same time I do not expect to more than cover cost. Our monitors are now in front of the best ground we apparently have, and two thirds of the run just completed was made on the same. As the whole of next run will be upon this spot we ought to get some improvement in the return.

**MALPASO.**—W. S. Welton, Sept. 19: Run No. 50 from Aug. 15 to Sept. 15, during which time washing was carried on for 412½ hours, with an average head of water of 500 in., has resulted in a produce of \$473 63 (94). At the commencement of this run nearly five days were lost in getting sluice, but considering the distance to be got over, and the hardness of the ground, I think we were fortunate in not having lost more time. On the 6th inst. we had a very severe storm, which carried away the ditch in several places, and caused a delay of nearly four days. At the same time, however, the flood was so great that the Aguas Calientes river was cleared of tailings, and since then we have been blasting the boulders and high pieces of rock in the centre of the river, so that the tailings may run off more easily in future. The present run has been made entirely by myself and Mr. Lacey, each of us taking the regular shifts of twelve hours by day and night, as I was desirous that no pains should be spared, or that there should be any doubt as to the cause of the low results. A very large quantity of top dirt and tailings that had fallen down had to be removed before we could reach the face; we then found gravel moderately hard, with about 20 ft. in thickness of the bottom very hard; a hard sand streak 12 ft. thick above, and a soft and streak 6 ft. thick at the bottom of the bank, which is nearly 80 ft. high. The gravel looks as good as that which we had at the upper part of the works, and the gold taken out was nearly all in coarse grains, but the amount is very much less than I anticipated. On the 15th inst. the water was again turned on, and since then some boulders have appeared at the bottom of the bank, and the gravel is much more coarse than before; under these circumstances, I think it advisable to run 15 days to see if there is any improvement before changing to a new place. The great number of large rocks that have to be picked out, and the large quantity of pipe-clay, require an unusual number of men to be employed, but on the other hand, a very large quantity of gravel can be run off, and the tailings on top are not at present more than 8 ft. in depth. Advantage was taken of the new opening, having been cleared by the floods, and to dry 50 ft. of sluice has been put in at the head. A considerable quantity of free gold was found in one of the boxes upon taking up the blocks, and I have had quicksilver put into this sluice.]

Petitions for winding up the Rica Gold Washing Company, the Malpas Gold Washing Company, the Malabar Gold Washing Company, and the Pynlimmon Lead Mining Company are to be heard on Nov. 8.

## LEAD ORES.

Date.	Mines.	Tons.	Price per ton.	Purchasers.
Oct. 28	Central Foxdale	65	£12 12 0	Adam Eytton.
	Great Eastdale	25	8 19 0	Wells, Evans, and Co.
	30—Monydd Gorda	20	11 11 6	Walker, Parker, and Co.
	31—West Tankerville	20	9 13 6	Sheldon, Bush, and Co.

## PERUVIAN TIN ORE SOLD IN LIVERPOOL.

Date.	Mines.	Tons.	Price per ton.	Purchasers.
Oct. 23		7½	£31 5 0	Bolito and Sons.
		7½	31 5 0	Daubuz and Co.
		4	31 5 0	R. R. Michell and Co.
		3¼	31 5 0	Redruth Smelting Co.

## COPPER ORES.

Sampled Oct. 16, and sold at Swansea, Oct. 29.

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Spanish Ore	167	6¼	£2 13 6	Copper Ore	50	21½	£11 10 0
ditto	105	6¼	2 9 0	Aljustrel	67	4½	12 0 0
ditto	154	6¼	2 10 0	ditto	66	4½	2 6 0
Union	101	12½	6 17 6	ditto	14	40½	27 1 0
ditto	101	12½	6 16 0	ditto	23	55½	30 7 0
ditto	101	12½	6 16 6	Cambrian	31	21½	11 14 6
ditto	100	12½	6 16 6	ditto	40	14½	7 7 0
Caveira	81	7½	3 7 6	Juliana	54	13½	7 11 6
ditto	81	7½	3 7 0	Sobral	23	23½	13 7 6
ditto	80	7½	3 6 0	ditto	55	8½	4 0 0
ditto	80	7½	3 6 0	N. Quebrada	14	8½	4 0 0
Copper Reg.	80	28½	15 13 6	Copper Ore	6	7½	3 8 6
ditto	79	28½	15 2 6				

## TOTAL PRODUCE.

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Spanish Ore	476	£1223 13 6		Cambrian	71	£657 9 6	
Union Ore	403	2753 0 0		Juliana	54	409 1 0	
Caveira	322	1074 14 6		Sobral	78	527 12 6	
Copper Reg.	209	3023 17 6		New Quebrada	14	61 12 0	
Aljustrel	169	1329 0 6		Copper Ore	6	20 11 0	

## COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Copper Miners' Company	354	£1,712 0 0
P. Grenfell and Sons	90	1,212 0 0
Nevill, Druce, and Co.	316½	1,841 12 6
Vivian and Sons	10½	1,224 0 6
Williams, Foster, and Co.	520	1,901 12 6
Mason and Elkington	55	230 0 0
Charles Lambert and Co.	79	1,194 17 6
Sweetland and Co.	202	1,381 3 6
Landore Copper Company	77	716 13 6

Total ..... 1862 ..... £11,085 12 0  
NO SALE on Nov. 12.

## TOTALS AND AVERAGES.

21 weeks.	Produce.	Price.	Per unit.	Standard.
Whole sale	1862	11 15 15	£3 0 0	1,834 300

## COPPER ORES.

Sampled Oct. 16, and sold at Tab's Hotel, Redruth, Oct. 31.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
Mellanar	77	£2 13 0	East Pool	42	£2 7 0
ditto	75	2 15 0	West Tolgus	70	6 16 8
ditto	73	3 6 0	ditto	68	4 14 6
ditto	70	2 13 0	ditto	60	6 8 0
ditto	67	3 5 6	ditto	52	7 13 6
ditto	58	2 0 6	West Seton	45	4 2 6
ditto	55	2 1 6	ditto	37	3 6 0
ditto	55	2 4 6	ditto	32	3 0 6
ditto	55	8 7 0	Buttack	45	5 10 6
East Pool	66	1 11 6	ditto	44	5 10 6
ditto	61	2 7 6	West Bassett	43	2 18 0
ditto	56	2 6 0	New Cook's Kitchen	37	3 13 0
ditto	51	2 12 0			

## TOTAL PRODUCE.

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Mellanar	569	£1731 8 6		Buttack	90	£491 5 0	
East Pool	276	611 14 6		West Bassett	43	117 12 0	
West Tolgus	250	1502 13 0		New Cook's Kitchen	37	135 1 0	
West Seton	114	4 4 10 6					

Average standard ..... £3 18



ABRIDGED PROSPECTUS.

ISSUE OF 5000 SHARES OF £20 EACH, AT £2 PER SHARE PREMIUM.

THE

Isabelle Gold and Silver Mining Co.

(LIMITED).

Incorporated under the Joint Stock Companies Acts, 1862 and 1867, by which the liability of each shareholder is limited to the amount of his shares.

CAPITAL £150,000, IN 7500 SHARES OF £20 EACH,

of which 2500 shares have been issued.

Entitled to a cash bonus of £50,000 immediately the amount has been paid by the contiguous companies.

ISSUE OF 5000 £20 SHARES, each £20 share being entitled without payment to a £20 coupon, redeemable by annual drawings from the interest of £10,000 to be invested in the names of Trustees in Consols, and by an annual payment from the company of £5000; the first annual payment to be made on the 30th November 1880. Shareholders subscribing for these shares will ultimately hold their shares free of cost. The cost may be repaid in 1879, whilst the holder of the last undrawn £20 coupon will in addition receive £10,000 Consols. [The preceding paragraph is copyright.]

Deposit £1 per share on application, and £21 per share on allotment.

Share Warrants to bearer will, at the option of applicants, be issued instead of Share Certificates.

Advantages to subscribers may be thus summarised:—

- 1st.—An advance on the market value of the share, as the natural consequence of profits to be derived from the mines.
- 2nd.—Return of the original subscription by means of annual drawings secured by (Consols) English Government Stock.
- 3rd.—The increasing value of the coupons as their number diminishes half-yearly.
- 4th.—The last £20 coupon will be entitled to £10,000 Consols.
- 5th.—The dividends which must arise from the use of the tunnel, as well as by aiding in the formation and development of other companies.
- 6th.—From the sole agency for North and South America for the use and sale of Col. Beaumont's rock drills.

Where no allotment is made the deposit will be returned in full.

DIRECTORS.

The Right Honourable the Earl POULETT, 7, Palace Gate, Kensington, W., and Hinton St. George, Crewkerne, Somerset.

Major-General CHARLES CAMPBELL, 18, Gloucester Place, Portman Square, W., and the Oriental Club, W.

ROBERT GILLOW DUNN, Esq., 17, Devonshire Street, Portland Place, W.

MANAGING DIRECTOR—HENRY HAYMEN, Esq., formerly Chairman of the Don Pedro North del Rey Gold Mining Company, which company during his chairmanship paid for several years dividends of 100 per cent.

CONSULTING ENGINEER—Colonel FRED. BEAUMONT, M.P.

BANKERS—THE IMPERIAL BANK (Limited), 6, Lothbury, London, E.C.

BROKER—JOHN INCHBALD, Esq., Stock Exchange, and 2, Cophall Court, London, E.C.

SOLICITOR—OSBORN JENKYN, Esq., 64, Lincoln's Inn Fields, London, W.C.

OFFICES—114, PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.

More than the whole of the first issue of shares of this company were applied for the first day the company was advertised, and it was only by largely cutting down their own and their friends' allotments that the directors were enabled even partially to comply with the applications from the public.

The directors in the allotment of the present issue have resolved that, without absolutely pledging themselves to make a *pro rata* allotment, in making the allotment priority of application will be considered.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

THE FRONCOCH MINE (Limited).—Capital 25,000*l.*, in shares of 2*l.* Formed to purchase the plant, machinery, and other effects of the Frongoch Mine, in Cardiganshire, and to acquire by purchase or otherwise the lease of the said mine, which contains deposits of lead, &c.; also the rights over adjacent lands for mining purposes. The subscribers (who take one share each) are—H. R. Moore, Thornton Heath, secretary; W. Bowman Middleton, miner, Southampton; W. Binkes, Croft; J. P. T. Kent, Southampton, gentleman; H. Davey, 80, Cornhill, broker; Alex. Kerby, 14, Great Manchester-street, solicitor; F. F. Powell, Stock Exchange, sharebroker. The following are the first directors—Messrs. Ross, Binkes, Bowman, Kent. Qualification 100 shares.

LONDON AND COUNTY HOUSE PROPERTY COMPANY (Limited).—Capital 200,000*l.*, in shares of 10*l.* To buy, hold, and sell freehold, copyhold, or leasehold lands, houses, buildings, and property, and to lay out, improve, dispose, sell, &c., such houses and lands. The subscribers (who take one share each) are—F. J. C. Halkett, Chiswick; J. H. Brook, Croydon; J. Williams, Barnes; W. Gre n, 35, Spring Gardens; D. Long, 41, Parliament-street; A. W. Maberley, Exeter Hall; W. J. N. Tomlinson, Exeter Hall.

CHELTEM COFFEE TAVERN COMPANY (Limited).—Capital 5000*l.*, in shares of 1*l.* To establish houses, rooms, and other places of a like nature in Cheltenham and elsewhere, for the purpose of carrying on the business of refreshment-house keepers. The subscribers are—E. H. Gillman, Cheltenham, 325; E. Cornford, Cheltenham, 100; H. D. Marten, Cheltenham, 50; H. W. H. Law, Cheltenham, 100; J. A. Banks, Cheltenham, 100; J. Downing, Cheltenham, 50; J. A. Devin, Cheltenham, 50; A. Dyson, Cheltenham, 100; J. D. Steel, Cheltenham, 50; W. H. Linden, Cheltenham, 100; St. Clair Ford, Cheltenham, 425; E. Pilgrim, Cheltenham, 200.

HANFORD WATER OYSTER FISHERY COMPANY (Limited).—Capital 10,000*l.*, in shares of 5*l.* The establishment of an oyster fishery on the bed of the Hanford Water, and three creeks running into same in the county of Essex. The subscribers (who take 100 shares each) are—G. Richardson, Burnham; H. M. Milligan, Althorne; W. D. Barnett, 24, Grosvenor Mansions; P. Richmond, Burnham; G. P. Jay, Maldon; A. C. Freeman, Maldon; T. Kent, Southampton.

GUILD OF ST. GEORGE.—This association is unlimited. To determine and institute in practice the laws of laborious (especially agriculture) life and economy. The acquisition of plots of land in Great Britain and Ireland, and erection of schools, &c. Every member of the association undertakes to contribute to the costs of the association. The subscribers are—J. Rusk, Brentwood; D. Hudson, Ambleside; G. Baker, Birmingham; J. H. Chamberlain, Birmingham; F. Talbot, Bridgewater; R. Somerville, Windermer; R. Fletcher, Bolton-le-Moors.

METROPOLITAN AERATED WATER COMPANY (Limited).—Capital 100,000*l.*, in shares of 1*l.* Formed to purchase the leasehold premises, 62, Cast's street, Leicester square, the property of Hamilton and Co., and the manufactory carried on by them. The subscribers (who take one share each) are—H. J. Durkin, Castle-street; W. Cooke, Caledonian-road; W. Horton, 15, Gerrard-street; A. J. Colard, 21, Percival-street; W. H. Batts, 31, Gerrard-street; F. J. Homan, 87, Long Acre; G. T. Roberts, 12, Southampton-street.

ROCHESTER, CHATHAM, BROMPTON, AND DISTRICT TRAMWAYS COMPANY (Limited).—Capital 50,000*l.*, in shares of 10*l.* To construct and lay down tramways in the neighbourhood of Rochester, and Chatham, and to purchase and otherwise acquire tramways. The subscribers are—C. Phillips, 115, Cannon-street, contractor, 25; T. Jervis, 3, King-street, director of the General Share Trust, 25; A. J. Dobson, Surbiton, civil engineer, 25; T. Grover, Penge, manager of brick fields, 10; F. C. Phillips, 20, Basinghall-street, wood merchant, 25; S. H. Beckles, 43, Fish-street Hill, merchant, 25; L. Bishop, 28, Budge-row, accountant, 25.

COOMBE SLATE QUARRIES (Limited).—Capital 12,500*l.*, in shares of 10*l.* For the immediate acquisition of all the estate, right, title, and interest of Mr. Wendon, and others, to the slates, slabs, and other stones in, under, or upon the lands known as Coombe Quarry, in Devonshire, together with all plant and machinery. The subscribers (who take one share each) are—R. D. Renwick, Torquay, coal merchant; C. E. Rivers, Torquay, accountant; W. Wendon, Torquay, slate merchant; S. Cash, Victoria and Albert Hotel Company, manager; T. Perry, Torquay, secretary; T. Grover, Penge, brick manufacturer; E. A. Harrison, Peckham, secretary.

COUNTERSLIP SUGAR REFINING COMPANY (Limited).—Capital 150,000*l.*, in shares of 500*l.* To carry into effect an agreement between J. Ford and W. H. Harford on the one part, and P. J. Worsley, whereby the vendors agree to sell for 30,000*l.* all the plant, machinery, in or upon the buildings, Counterslip, Bristol. The subscribers are—G. W. Edwards, Bristol, 6; W. P. Trick, Bristol, 4; W. H. Wills, Bristol, 5; P. J. Worsley, Clifton, 6; H. Thomas, Bris-

tol, 6; W. M. Baker, Bristol, 3; L. Fry, Bristol, 2; E. Bush, Alve-ton, 6; C. Hill, Bristol, 4; E. Clarke, Bristol, 2; C. Thomas, Bristol, 6.

CHEPSTOW STEAMBOAT COMPANY (Limited).—Capital 5000*l.*, in shares of 25*l.* To carry, transmit, and convey passengers, merchandise, &c., between Chepstow and the ports of the Bristol Channel and other places. The subscribers are A. Yockney, Corsham, 4; W. Garrett, Chepstow, 4; T. W. Horne, Herne Hill, 2; E. W. Garrett, Monmouth, 1; F. E. Marden, East Sheen, 1; Sir W. Yockney, Tidenham, 4; H. C. Blaker, 3, Cloak-lane, 1.

THE DIRECT PROCESS IRON COMPANY (Limited).—Capital 50,000*l.*, in shares of 10*l.* To take over the ironworks and business of the Towcester Company (Limited), now in liquidation, and to acquire the letters patent granted to C. W. Siemens, and to carry on the business of ironmasters, &c. The subscribers (who take one share each) are—C. W. Siemens, 12, Queen Anne's Gate; P. J. Worsley, Clifton; J. Wethered, Clifton; Z. Lloyd, Stourport; A. E. Wenham, Birmingham; J. Head, Clapham; Alex. Simmons, 12, Queen Anne's Gate.

THE WEST YORKSHIRE PRINTING COMPANY (Limited).—Capital 600*l.*, in shares of 100*l.* The purchase of A. W. Stanfield's business at Wakefield. The subscribers (who take one share each) are—A. W. Stanfield, London; Emily L. Stanfield, London; A. J. C. Stanfield, London; G. E. Stanfield, London; N. Stanfield, London; Chas. Stanfield, Bradford; H. Smith, Wakefield.

THE JHANZIE TEA ASSOCIATION (Limited).—Capital 25,000*l.*, in shares of 5*l.* To purchase the tea gardens known as the Jhanzie tea estates, and the Burrothpook tea estates on the River Jhanzie. The subscribers (who take one share each) are—C. Hudson, London; J. Hudson, London; E. Wahab, London; F. Burrow, Westminster; A. Lawrie, London; L. Hart, London; A. Rogers, Kew.

MOUNT KEMBLE COAL AND OIL COMPANY (Limited).—Capital 100,000*l.*, in shares of 10*l.* To carry into effect an agreement for the purchase of the Mount Kemble Coal and Oil Company, in New South Wales, made between Alex. McArthur, M.P., on the one part, and W. O. Tibbets for the company. To purchase and otherwise acquire any other collieries, oilworks, &c., in New South Wales. The subscribers are—E. Hart, Crayford House, Highbury, gentleman, 250; W. Burall, Bromley, civil engineer, 120; E. Collins, 38, Portchester-terrace, M.P., 250; Alex. McArthur, Raleigh Hall, Brixton, M.P., 250; J. Pound, 81, Lombard-street, London, manufacturer, 100; H. Coburn, 54, Ladbroke-street, London, solicitor, 30; F. Tate, 527, Fenchurch-street, London, shipbroker, 50. The first directors are Messrs. Hart, Collins, McArthur, Pound.

GIBBS AND CANNING (Limited).—Capital 50,000*l.*, in shares of 50*l.* each. To adopt an agreement for the sale by C. Canning to the company of the business carried on by Gibbs and Canning, at Tamworth, as manufacturers of terra cotta, glazed stone ware, pipes, &c. The subscribers are—J. Gibbs, Evesham, 20; C. Canning, Tamworth, 320; G. Hunt, Evesham, 10; H. New, Evesham, 20; W. W. Brown, Evesham, 24; R. Cripps, Basington, 40; C. Whitfield, Tamworth, 20; J. Brain, Tamworth, 10; F. Clarke, Tamworth, 10.

KINGTON-UPON-HULL ALLIANCE LAND COMPANY (Limited).—Capital 21,000*l.*, in shares of 100*l.* each. The acquisition of land in Kington and elsewhere for the purpose of selling, building, &c. The subscribers (who take 10 shares each) are—E. Star, Hull; J. T. Oliver, Hull; J. Lidster, Hull; A. Tiplady, Hull; E. Balchin, Hull; R. Penton, Cottingham; G. Perkins, Hull.

MANCHESTER STEAM USERS' ASSOCIATION.—At the monthly meeting of this association, held at the offices on Tuesday, Mr. Thomas Schofield in the chair, Mr. L. E. Fletcher, chief engineer, presented his report, which gave particulars of visits of inspection and a record of boiler explosions from Sept. 21 to Oct. 25. Of this report the following is an abstract:—575 visits of inspection were made, and 958 boilers examined, 685 externally & 9 internally, 4 in the flues, and 259 entirely, while, in addition, 9 boilers were tested by hydraulic pressure. The following defects were met with:—Fractures, 13; blistered plates, 10; internal corrosion, 13; external ditto, 20; internal grooving, 18; fusible plugs out of order, 1; pressure gauges ditto, 24; boilers without feed back pressure valves, 8; cases of deficiency of water, 1. Total, 103 defects. During the past month four explosions occurred, killing three persons and injuring seven others, which brings the return from Jan. 1 to the present time up to 30 explosions, killing 42 persons and injuring 60 others. Not one of these explosions arise from boilers under the inspection of this association. "The greater number of the explosions (the report stated) were due to the use of old worn-out boilers, but says, defective safety-valves, and other simple causes which might easily have been corrected by the exercise of common care and common knowledge, so that the greater portion of this loss of life would have been prevented had competent inspection been enforced by law." One explosion arose from making the plates of an externally fired boiler too thick. In another case, that of a locomotive boiler, which exploded at a colliery, an officer of the association visited the scene

of the explosion, but was not allowed to examine the boiler. In this case it was observed:—"As boiler explosions jeopardise the public safety every opportunity should be given for making legitimate investigations of these disasters. Private interests should not be allowed to override the public good."

Mining Correspondence.

BRITISH MINES.

ABERDAUNANT.—S. Toy, Oct. 30: The deep adit cross-cut is now driven north 9 fms. 4 ft. This week we have met with a hard band of grit rock, about 1 ft. wide, which we have cut through, and the forebore is into kilaas ground again, but the ground is getting harder as we extend the cross-cut north. All the works are going on as usual.

BETWS-Y-COED.—H. T. Haley, Oct. 28: There is no change to notice in any of the points underground since my last. The carpenters are getting on well with launders to crusher wheel, and will quickly complete this work. Owing to the rough weather the masons have been delayed in building pumping wheel pit; a few fine days will enable them to finish this, when we shall commence to get the wheel together with all dispatch.

BLAEN CAELAN UNITED.—Jonathan Pail, Oct. 30: The cross-cut to the lode from the bottom of the engine-shaft, 30 fms. below the deep adit level, is close to the vein of lead, but has not yet cut it. I hope next week to report a valuable discovery of lead at this point. There is no change at the 35 east and west from bottom of winze; worth 20*l.* to 25*l.* each end. There is no other change. Weather very cold, and snow has fallen on the mountains.

BLUE HILLS.—S. Bennetts, P. Bennetts, Oct. 26: The north lode in the 30 east end continues to open up very well, and worth 10*l.* to 12*l.* per fathom. A stop in the back of this level is worth 8*l.* to 9*l.* per fathom. Two tribute pitches are let on the top lode, in the 80, at 10*l.* in 1*l.*

BODIDRIS.—H. Hetchkiss, Oct. 30: The weather during this week has been very tempestuous, which has hindered our surface operations very much, but I am pleased to say the shaftmen are progressing satisfactorily with the shaft; they have excavated and divided the same from surface down to the present bottom, and are now busy sinking and rising from the 45; we expect to break through here this afternoon, when the stuff will fall into the 45 to await the whim-kibble down through this shaft, which will be in readiness for them when required. In the 45, east of easternmost shaft, the men have completed the cutting up of the level to forebore, and are now driving east on the lode, at 140*l.* per fathom. In the 60, on Maes-y-Pwll lode, east of cross cut near forebore, I have two men here rising up to prove the lode, where we had one 3 ft. wide, containing spar, mixed nicely with blende; the other four men from this winze I have on surface for a short time. The stops in the 30 is much the same as for some time past, producing first-class quality ore.

CAMBRIAN MINE.—Capt. T. Glanville, Oct. 26: Esgair Ffrith: Eastern Shaft: I am pleased to say the lead part of the lode in the back of the 70 yard level west of shaft is holding equally as good as when reported on last week, and will produce 2 tons of lead ore per yard. The copper part of the lode in the pit in the bottom of shaft is remarkably rich, and will produce 3 tons of copper ore per yard. On Wednesday next we shall recommence sinking the shaft with all speed for a deeper level. The sampling of our ore at Swansea is as follows:—Lot No. 1, 31 tons of 21*l.* per cent. copper; lot No. 2, 40 tons of 14*l.* per cent. copper.—Esgair Hir:—We are still driving the cross-cut south to intersect the main part of great lode.

COMBARTIN.—T. Comer, Oct. 31: In the 15 east the lode extends over the whole width of the level, composed principally of quartz and munda, with a little lead and blende intermixed. The caunter lode in the ends driving south-east and north-west from the adit cross cut is about 4 ft. wide, well-defined, and producing a little lead and blende, but not enough to realise. The adit cross-cut end is in a hard run of quartzose capel, full of small vauclays, in which we find good spots of lead and blende, and is letting out water freely.

COURT GRANGE.—J. G. Green, Oct. 31: As under I beg to hand you finding list for two months (nine weeks) ending December 28. To stop back of 45, east of cross cut, to four men, at 60*l.* per fathom; worth 8*l.* to 10*l.* per fathom; to stop back of the 30, east of Footway, to four men, at 60*l.* per fathom; worth 12*l.* to 15*l.* per fathom. To stop bottom of the 14 by engine cross-cut, to two men, at 60*l.* per fathom; worth 15*l.* to 20*l.* per fathom. To stop back of 14, east of cross cut, to six men, at 60*l.* per fathom, including wheeling of stuff to pass; worth 20*l.* per fathom. To stop back of 14, east of cross cut, to four men, at 60*l.* per fathom; worth 10*l.* to 12*l.* per fathom. To stop back of 14, eastern end, to 14 men, at 7*l.* per fathom, including clearing stuff; worth 25*l.* per fathom. The clearing and filling of stuff throughout the mine, to nine men, at 5*l.* per score skiploads. At surface the Brogin reservoir embankment has been stopped until a more favourable season for such work. We have an ample supply of water, and dressing is progressing favourably.

DE BROKE.—J. Phillips, Oct. 30: The 55, driving east of Wilson's shaft, produces good stones of ore occasionally. The lode in the 45 west is of good width, and continues to yield fine stones of lead and copper ore, with crystalline spar. The lode in the winze below the 35 east is 7 ft. wide, and worth about 15*l.* of lead ore per fathom. The stops are turning out very fairly, and looking encouraging. We sold 20 tons of lead ore on Saturday last. The dressing and all other machinery and pitwork in good order.

DERSBY CONSOLS.—J. Roberts, W. Sandoe, Oct. 20: We have let the end on the east and west lodes, towards Cobblers', to six men, at 9*l.* per fathom, over 25 per cent. less than the previous price, the ground being so much more favourable than at the former setting. The vugh, which last week was inclined up, is now opening again, and in the end there are good stones of blende, mixed with some spar. The change of ground will enable us to reach the Cobblers' lode much sooner than we anticipated.

DERSBY MOUNTAIN.—John Roberts, William Sandoe, Oct. 30: No. 1 end is slightly improved since last week, a little more lead coming in the bottom of the end; set again to two men, at 4*l.* per fathom. In No. 3 the rise is set to two men, at 15*l.* per fathom, the rise to be carried 9 ft. long; the lode is full 2 ft. wide, and contains good ribs of solid lead. The stop in No. 4 continues much the same as for some time past, producing moderately good stuff for the crusher. The vugh below this level we are clearing up after having fixed tackle and secured down to the stuff and stone, present appearance we hope to get down to No. 5 in a short time. We are making fair progress with clearing No. 5. We shall get the stone-breaker to work shortly, when we shall commence treating the stuff from the stop in No. 4.

DENBIGHSHIRE CONSOLIDATED.—R. Prince, A. Francis, Oct. 31: There is no noticeable change in our permanent levels east and west, but they are being urged forward with all speed. The produce from the 66 during the last fortnight has been excellent. The yield from the pitch in the back of the 112 west has also been good. Our dressing floors look well.

DERWENT.—John Morphet, Oct. 29: I beg very respectfully to hand you these particulars on our underground operations, all of which I saw yesterday:—Jeffries' Shaft, Middle Vein: In the 95 east and the 93 west there is no change. The sides in the former level yield 1 ton ore per fathom, and the stops are worth—No. 1, 15*l.* cwt.; No. 2, 18*l.* cwt.; No. 3, 16*l.* cwt.; and No. 4, 12*l.* cwt. Over the latter level No. 1 stop produces 1 ton 6 cwt. of ore per fathom; No. 2 is very poor, and will be so for about 3 fms. more in length, when there will be an improvement; No. 3 is worth 1 ton 8 cwt. of ore, 1 ton; and No. 5, 11 cwt.—Sun Vein: In the 70 west of shaft, No. 1 stop, East of shaft, the 70 west, 10 cwt. of ore per fathom, and the stops in the back of 14 cwt.—West of shaft, Middle Vein: The 95 east of shaft, continues very good, worth full 1 ton 12 cwt. ore per fathom, and is showing excellent backs. The 74 west of shaft, at the bottom of high coal sill, is poor, but in the immediate back of the same there is strong ore. The stop over this level, 6 fms. back from end, is looking better, at present worth 18*l.* cwt. ore per fathom. The various branches are moving on uninterruptedly, and all are being pushed to the utmost.

DUBBY SYKE.—W. Vipond, Oct. 25: The two men are continuing the east end forward in the vein, as it is still in the plate, except a single spot of stone in the middle part of the forehead. The vein shows a material change, and is now likely to show much till it is set again in the limestone above. I may possibly have four men to this next week.

EAST CADRON.—James Kellow, Oct. 30: Williams' shaftmen have completed pit in the 150, and are now engaged in cutting ground for pumping gear, preparatory to sinking the winze below this level, on the caunter lode. We expect to commence this sinking in a fortnight. The 150 west, on the caunter, to drive by six men, 3 fms. stent, at 10*l.*; it was driven 2 fms. 4 ft.; the lode in the 3 ft. is split in branches, with a little ore and munda in the back of the 90, on Child's, these will again unite as we drive west. The stop in the stopes in the back of the 105 ore to the value of 25*l.* per fathom. The lode in the stopes in the back of the 105 ore to the value of 15*l.* ton ore per fathom. There is no change to call for remark in the tribute pitches.

EAST VAN.—Captain Williams, Oct. 31: I have no change to report from here this week.

GAWTON COPPER.—G. Rowe, G. Rowe, jun., Oct. 26: The fine stones of ore and now intersected in the 117 cross-cut south is producing fine stones of ore. The munda, intermixed with capel and spar, of a very kindly appearance. The lode in the winze going down below the 105 is 10 ft. wide, producing munda and ore to the value of 25*l.* per fathom. The lode in the stopes in the back of the 105 ore to the value of 25*l.* per fathom. All other points are without change. Our last sampling of ore yesterday (Friday) weighed 20 tons 19 cwt. 2 qrs.

GLASGOW CADRON.—W. Taylor, W. J. Taylor, Oct. 29: No change in the notice in the sinking of Elliott's shaft, which is progressing satisfactorily. In the 90 west we are still driving on the branch, which appears to be going on towards the north lode, producing a little ore, but not of much value. We want to get the west to cross-cut under the winze, commencing down from the 75, where the lode is worth from 1*l.* to 15*l.* per fathom. In the 90 east the ground is a little more favourable, and the lode a little improved; worth from 5*l.* to 6*l.* per fathom. We are looking for further improvements in this end, as we have a good lode in the winze coming down before it from the 75, worth fully 15*l.* per fathom. In the cross-cutting south from the 75 we have easier ground, and we hope to find the lode taken off in this direction. No change in the midway east, or any other point, since our last report. The stopes and pitches throughout the mine continue to look very well, and are turning out their usual quantities of ore. Our next sale of ore will be computed, about 225 tons.

GLENROY.—R. Rowe, Oct. 29: I have no alteration to report in the shaft to-day, which is now down to the 95; the lode is about 5 ft. wide, containing a little blende, but the composition of the lode does not materially change. We are deep enough to meet with the favourable run of ground in the 65 south, which we expect inclines towards the shaft; our best course will be to continue sinking to the 100, at least before driving out. Now that we have a steady supply of water for the wheel I have increased the sinking force from 8 to 12 men.

GORSIEDD AND MERLLYN.—W. Edwards, Oct. 31: The joint that we have passed through in the north cross-cut is wider and better in the bottom than in a roof. There is very nice lead coming in the bottom. We think this is only a joint showing in the heading of the vein, and that we are not yet far enough through the cross-cut, which has been extended since my last 5 ft. 6 in. When we have drawn to surface some splendid rocks of solid lead, and I hope very soon now to send you an excellent report.

GREAT BOLWY.—Oct. 31: The lode in Garden shaft seems to be opening up well; we have four bargains on tribute, worked by 24 men, each lot turning out good lead and blende. The eastern ground is untouched here, and if it continues











1911. 1912. 1913. 1914. 1915. 1916. 1917. 1918. 1919. 1920. 1921. 1922. 1923. 1924. 1925. 1926. 1927. 1928. 1929. 1930. 1931. 1932. 1933. 1934. 1935. 1936. 1937. 1938. 1939. 1940. 1941. 1942. 1943. 1944. 1945. 1946. 1947. 1948. 1949. 1950. 1951. 1952. 1953. 1954. 1955. 1956. 1957. 1958. 1959. 1960. 1961. 1962. 1963. 1964. 1965. 1966. 1967. 1968. 1969. 1970. 1971. 1972. 1973. 1974. 1975. 1976. 1977. 1978. 1979. 1980. 1981. 1982. 1983. 1984. 1985. 1986. 1987. 1988. 1989. 1990. 1991. 1992. 1993. 1994. 1995. 1996. 1997. 1998. 1999. 2000. 2001. 2002. 2003. 2004. 2005. 2006. 2007. 2008. 2009. 2010. 2011. 2012. 2013. 2014. 2015. 2016. 2017. 2018. 2019. 2020. 2021. 2022. 2023. 2024. 2025. 2026. 2027. 2028. 2029. 2030. 2031. 2032. 2033. 2034. 2035. 2036. 2037. 2038. 2039. 2040. 2041. 2042. 2043. 2044. 2045. 2046. 2047. 2048. 2049. 2050. 2051. 2052. 2053. 2054. 2055. 2056. 2057. 2058. 2059. 2060. 2061. 2062. 2063. 2064. 2065. 2066. 2067. 2068. 2069. 2070. 2071. 2072. 2073. 2074. 2075. 2076. 2077. 2078. 2079. 2080. 2081. 2082. 2083. 2084. 2085. 2086. 2087. 2088. 2089. 2090. 2091. 2092. 2093. 2094. 2095. 2096. 2097. 2098. 2099. 2100. 2101. 2102. 2103. 2104. 2105. 2106. 2107. 2108. 2109. 2110. 2111. 2112. 2113. 2114. 2115. 2116. 2117. 2118. 2119. 2120. 2121. 2122. 2123. 2124. 2125. 2126. 2127. 2128. 2129. 2130. 2131. 2132. 2133. 2134. 2135. 2136. 2137. 2138. 2139. 2140. 2141. 2142. 2143. 2144. 2145. 2146. 2147. 2148. 2149. 2150. 2151. 2152. 2153. 2154. 2155. 2156. 2157. 2158. 2159. 2160. 2161. 2162. 2163. 2164. 2165. 2166. 2167. 2168. 2169. 2170. 2171. 2172. 2173. 2174. 2175. 2176. 2177. 2178. 2179. 2180. 2181. 2182. 2183. 2184. 2185. 2186. 2187. 2188. 2189. 2190. 2191. 2192. 2193. 2194. 2195. 2196. 2197. 2198. 2199. 2200. 2201. 2202. 2203. 2204. 2205. 2206. 2207. 2208. 2209. 2210. 2211. 2212. 2213. 2214. 2215. 2216. 2217. 2218. 2219. 2220. 2221. 2222. 2223. 2224. 2225. 2226. 2227. 2228. 2229. 2230. 2231. 2232. 2233. 2234. 2235. 2236. 2237. 2238. 2239. 2240. 2241. 2242. 2243. 2244. 2245. 2246. 2247. 2248. 2249. 2250. 2251. 2252. 2253. 2254. 2255. 2256. 2257. 2258. 2259. 2260. 2261. 2262. 2263. 2264. 2265. 2266. 2267. 2268. 2269. 2270. 2271. 2272. 2273. 2274. 2275. 2276. 2277. 2278. 2279. 2280. 2281. 2282. 2283. 2284. 2285. 2286. 2287. 2288. 2289. 2290. 2291. 2292. 2293. 2294. 2295. 2296. 2297. 2298. 2299. 2300. 2301. 2302. 2303. 2304. 2305. 2306. 2307. 2308. 2309. 2310. 2311. 2312. 2313. 2314. 2315. 2316. 2317. 2318. 2319. 2320. 2321. 2322. 2323. 2324. 2325. 2326. 2327. 2328. 2329. 2330. 2331. 2332. 2333. 2334. 2335. 2336. 2337. 2338. 2339. 2340. 2341. 2342. 2343. 2344. 2345. 2346. 2347. 2348. 2349. 2350. 2351. 2352. 2353. 2354. 2355. 2356. 2357. 2358. 2359. 2360. 2361. 2362. 2363. 2364. 2365. 2366. 2367. 2368. 2369. 2370. 2371. 2372. 2373. 2374. 2375. 2376. 2377. 2378. 2379. 2380. 2381. 2382. 2383. 2384. 2385. 2386. 2387. 2388. 2389. 2390. 2391. 2392. 2393. 2394. 2395. 2396. 2397. 2398. 2399. 2400. 2401. 2402. 2403. 2404. 2405. 2406. 2407. 2408. 2409. 2410. 2411. 2412. 2413. 2414. 2415. 2416. 2417. 2418. 2419. 2420. 2421. 2422. 2423. 2424. 2425. 2426. 2427. 2428. 2429. 2430. 2431. 2432. 2433. 2434. 2435. 2436. 2437. 2438. 2439. 2440. 2441. 2442. 2443. 2444. 2445. 2446. 2447. 2448. 2449. 2450. 2451. 2452. 2453. 2454. 2455. 2456. 2457. 2458. 2459. 2460. 2461. 2462. 2463. 2464. 2465. 2466. 2467. 2468. 2469. 2470. 2471. 2472. 2473. 2474. 2475. 2476. 2477. 2478. 2479. 2480. 2481. 2482. 2483. 2484. 2485. 2486. 2487. 2488. 2489. 2490. 2491. 2492. 2493. 2494. 2495. 2496. 2497. 2498. 2499. 2500. 2501. 2502. 2503. 2504. 2505. 2506. 2507. 2508. 2509. 2510. 2511. 2512. 2513. 2514. 2515. 2516. 2517. 2518. 2519. 2520. 2521. 2522. 2523. 2524. 2525. 2526. 2527. 2528. 2529. 2530. 2531. 2532. 2533. 2534. 2535. 2536. 2537. 2538. 2539. 2540. 2541. 2542. 2543. 2544. 2545. 2546. 2547. 2548. 2549. 2550. 2551. 2552. 2553. 2554. 2555. 2556. 2557. 2558. 2559. 2560. 2561. 2562. 2563. 2564. 2565. 2566. 2567. 2568. 2569. 2570. 2571. 2572. 2573. 2574. 2575. 2576. 2577. 2578. 2579. 2580. 2581. 2582. 2583. 2584. 2585. 2586. 2587. 2588. 2589. 2590. 2591. 2592. 25



## Notices to Correspondents.

\* \* \* Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be filed on receipt; it then forms an accumulating useful work of reference.

OLD METALS.—Could some correspondent give me the address of a broker, in London or elsewhere, dealing largely in old brass, copper, gun metal, &c.?  
PLYMOUTH.—"J. C. S. P." (Tunbridge Wells) should write to the London representative of the company, Mr. J. H. Murchison, Austinfrilars, who will forward the information required.

Received.—T. P. Smith (Hobart Town)—"J. A. J." (Madrid)—"H. C. D."—"P. A. D." (Perak)—"J. B." (San Francisco)—"Fairplay." We cannot tell who T. Hardy is. The circular respecting the alleged failures of Walker's De-aching Hook being anonymous will not carry much weight.—"Caution"—"F. C. E." (West Chiverton)—"Omega" (Pant y Mwyn)—"Shareholder" (Enlstock): A letter appears in another column upon the subject—"R. H." (Manchester)—"Shareholder" (Penrith)—"Constant Reader" (Swansea)—"Euclid." We could not devote space for publication of such elaborate details.

## THE MINING JOURNAL.

## Railway and Commercial Gazette.

LONDON, NOVEMBER 2, 1878.

## LEAD MINING.

In several districts, more particularly in the North of England, we are told that lead mining is in a very depressed state, and that whilst several of the mines have been closed for the present the number of hands employed at many others has been materially reduced. This state of things is not caused by any marked falling off in the consumption, for whilst the home production has been declining our imports have been increasing in a larger ratio. It may, therefore, be assumed that the present low price is the leading cause for the existing stagnation, and the determination of men like Mr. W. B. BEAUMONT, M.P., to only partially work their mines until a better time comes. Over production appears to be taken by that gentleman and others as the reason for the price of lead being so low, but we can scarcely agree with them, seeing that any falling off in the output of English lead leads to an increase in the demand for foreign. Believing, therefore, that any quantity of lead that is required can be easily obtained at existing rates we do not see what object can be attained by either the closing of our mines or partially working them, for the only result is handing over more of the trade to our continental and other competitors. For our own part, we should prefer seeing the production of English lead much greater than it has yet been, and our imports much less. Long as lead has been worked in Great Britain there are still vast stores left, whilst there are also large fields as yet untouched, so that there is no ground of a substantial character why foreign lead should be so largely used as it is, or why our own mineowners should do all they can to still further increase our imports. As it is more lead in the form of pig and sheet is imported into England than there is lead ore raised in the whole of Great Britain, and this is certainly anything but satisfactory. That we are not speaking outside the book, we find that the actual quantity of pig and sheet lead that arrived in England from abroad in 1877 was 94,412 tons, of the value of 2,015,438*l.*, whilst the production of lead ore during the same year in the United Kingdom was 80,850 tons, with 497,375 ozs. of silver, of the total value of 967,680*l.*

This is a strong proof that large as are our supplies of lead, and moderate as are the wages paid to the miners, we are unable to hold our own in the home markets, whilst foreigners, after paying freights and dues, are able to beat us on our own ground. This is anything but a healthy state of things, and certainly is somewhat opposed to English views of mining enterprise. Our colliery owners have been threatened frequently with the loss of their continental trade, owing to the activity of German and other coalmasters, but they have not been afraid to sell even without a profit so as to maintain their position abroad, and the result has proved they were right, for English coal is now more extensively exported than ever. But so far as regards lead, with its low price our imports have gone on increasing *pau passu* with our own diminution of production. In illustration of this we may say that in the first nine months of 1876 the quantity of pig and sheet lead imported was 57,586 tons, the value being 21*l.* 10*s.* per ton; in the same period of 1876 it was 68,760 tons, without any alteration in price; and for the corresponding months of 1878 the imports were 75,306 tons, whilst the price had fallen to 18*l.* 15*s.* 10*d.* per ton. But we also export pig, rolled, sheet, and other lead this year so far to the extent of 26,812 tons, the average price received for which was 19*l.* 2*s.*—very fair, all things considered, one would think, when foreign is so much lower. But it is a singular fact that, unlike all other British minerals, lead has oscillated more and the production has in no way progressed during the last thirty years, whilst it has also of late been less rich in silver. Prices during the two periods have also greatly changed, so that at one time large fortunes must have been made with comparative ease when the mines were more actively worked. Thus, in 1855 no less than 92,330 tons of lead ore were raised in Great Britain, the price for pig-lead being then 23*l.* 3*s.* per ton, whilst now it only ranges from 15*l.* 5*s.* to 16*l.* This is certainly a great discrepancy. But the difference in all probability was not much greater than in other metals, for in the year alluded to (1855) the average price of pig-iron was 4*l.* 4*s.* per ton, whilst tin realised an average of 120*l.* per ton. If, however, we go back ten years we find that lead was then cheaper than it was in 1877. In 1868 English pig averaged 19*l.* 6*s.* 6*d.* per ton; ditto sheet, 20*l.* 3*s.*; ditto pig (W.B.), 21*l.* 6*s.* 4*d.* For 1877 the quotations were—English pig, 20*l.* 11*s.* 3*d.* per ton; English pig (W.B.), 21*l.* 7*s.*; and sheets and bars, 21*l.* 13*s.* 9*d.* per ton. Certainly during the present year prices of English lead have come down, but so, also, have those of foreign brands, for whilst the value of the latter in pig and sheet in June was 19*l.*, in August they declined to 18*l.*, and in September there was another drop of 1*l.* per ton, leaving the price 17*l.* Still, foreign lead is plentiful, notwithstanding the disadvantages it labours under in competing with the English.

In several districts of late years the production has fallen off very much, whilst some mines have been altogether closed from various local causes, yet as a rule where there are stores of lead they are worked, but capitalists like Mr. BEAUMONT can afford to allow their lead to remain underground until either by a greatly increased consumption, or the falling off in the production of mines both at home and abroad, the demand springs up and prices with it. But who can say when that time will arrive? As it is the disinclination on the part of some English mineowners to sell at present rates is helping foreigners as much as they can, and putting the trade into their hands, a policy the wisdom of which we think is questionable with respect to the falling off in the output of our English mines of late years is proof of that statement. We give the produce of the various counties for 1868 and 1877, so that the change during the last ten years will be seen:—

|                         | Tons 1868. | Tons 1877. |
|-------------------------|------------|------------|
| Cornwall.....           | 8,415      | 2,166      |
| Devonshire.....         | 1,522      | 337        |
| Somersetshire.....      | 1,135      | 453        |
| Derbyshire.....         | 5,933      | 5,066      |
| Lancashire.....         | 941        | —          |
| Staffordshire.....      | 116        | —          |
| Shropshire.....         | 4,943      | 6,634      |
| Yorkshire.....          | 7,694      | 5,011      |
| Cumberland.....         | 5,520      | 3,041      |
| Westmoreland.....       | 2,053      | 1,751      |
| Northumberland, &c..... | 23,720     | 25,086     |
| Total.....              | 61,492     | 49,545     |

Lancashire and Staffordshire appear to have died out altogether, whilst other counties, especially those in the South, look as if they were going on the same road, for it is well known that the reserves

in them are by no means large. Derbyshire is one of the oldest lead counties in England, but like some others has had to contend with a great deal of water that has drained out the capital of several companies without clearing the mines, but there are still large stores left, and at one mine alone, where the water has been successfully overcome, more than 100 tons of lead are now brought to surface monthly, whilst some other places are also being cleared, and will be in operation before long, so that Derbyshire is likely to look better than for some years past. Cumberland shows a considerable decline, and this year is likely to do so still more, for of late some of the mines are being abandoned. There are only a few mines in Shropshire, so that nearly the whole of the lead obtained during last year was from Roman Gravel, 2342 tons; Snailbeach, 2463 tons; Tankerville, 1053 tons. The most prolific of our counties, Northumberland and Durham, shows an increase during the decade, but it is worth while noting that whilst of the 23,720 tons of ore raised in 1868, no less than 12,360 tons came from the mines of Mr. W. B. BEAUMONT, only 9321 tons came from them in 1877. A good many changes have taken place in Yorkshire year after year, and of late the mines have a healthier appearance, and the returns are likely to be more favourable than they have been.

Whilst some of our English owners of lead mines appear inclined to husband their stores of lead until it will realise more money, no such feeling is entertained in connection with the mines in North Wales, for there every effort is being made to obtain as much lead as possible, and not only are extensions being made and machinery put down for developing the minerals in all directions, but new mines are being sunk. Water has been the great drawback to the mineral wealth of North Wales, but that has been taken in hand, so that the future looks more promising. Still some of the counties have done well in lead of late, as will be seen by a comparison with 1868, as follows:—

|                    | Tons 1868. | Tons 1877. |
|--------------------|------------|------------|
| Cardiganshire..... | 7230       | 5849       |
| Carmarthen.....    | 500        | 687        |
| Montgomery.....    | 4019       | 8067       |
| Flintshire.....    | 4321       | 3183       |
| Denbighshire.....  | 8266       | 2898       |
| Carnarvon.....     | 283        | 1581       |
| Other mines.....   | 256        | 211        |
| Total.....         | 24,830     | 22,476     |

In the Isle of Man the production last year of lead ore was 4464 tons; of Ireland, 1655 tons; and of Scotland 2797 tons, being up to the average. Disheartening, however, as the trade may be said to be so far as regards price, still changes will come, as they have so frequently come before, and the best way to meet the difficulty is to boldly face it, for there is nothing to be gained by sending the trade abroad, as it is evident that foreign mineowners are in a position to sell even lower than they are now doing, so that any falling off in the production of English lead will be to their advantage.

## THE MANUFACTURE OF STEEL.

Despite the stagnation in the iron and associated branches of trade, more than ordinary attention is now being devoted to the production of steel by different processes, and for a variety of purposes for which iron was formerly used. Special qualities are now being made in the open-hearth, by the BESSEMER process, and also by the system of Dr. SIEMENS, by which iron and steel are made direct from the ore. The latter process is a very simple one, and has been successfully carried out at Towcester, in Northamptonshire, although the ore found in that locality is of a rather inferior character. The comparative ease with which the iron and steel is made by Dr. SIEMENS is not unlikely to cause much less of the latter to be made by the more elaborate processes, for he tells us that by mixing iron ore in powder with about 25 lb. of its weight of powdered coal, and in exposing the mixture for some hours to the heat of a common stove or of a smith's fire metallic iron is formed which, on being heated to the welding point on the smith's hearth, may be formed into a horse-shoe of excellent quality. But the iron or steel can be produced in two ways—one by way of stationary, and the other by means of a rotative furnace chamber, the latter being applicable for the smelting of poor ores. Steel plates for boilers and ships are now becoming in greater request than ever, and the result of experiments have shown that BESSEMER steel, and that made by the SIEMENS process, in endurance and durability are far beyond the strength of ordinary wrought-iron. In resisting a mechanical force it was found that a plate of steel of 6-16ths of an inch in thickness had a far greater resisting power than an iron one 7-16ths of an inch thick. Plates, it may be said, are now being made for the Admiralty, but there is no doubt but what improvements will yet be made in them, whilst steel is now being made more uniform than it ever has been, so that grades adapted to all special purposes can be produced. Formerly this was not the case, but now something more like perfection is being arrived at by more complete analyses, and by keeping a complete record of the component parts, at least of carbon, manganese, phosphorus, silicon, and any element which contains a tenth of 1 per cent. By such a system there is a complete recipe given to the steelmaker by which uniformity is attained, and this is what has long been required. This is necessary, seeing that whilst both rail and boiler steel are soft as compared with many structural steels, yet whilst what would be well suited for rails would be just the reverse for boilers; hence the necessity for the principal ingredients of each grade of steel being accurately known. Lloyd's, it appears, have now fully recognised steel boilers, and have fixed a test for them. Some of the plates are taken indiscriminately, and have to show a strength of from 28 to 30 tons lengthwise of the grain per square inch, the limit of elasticity having to bear the same proportion to the breaking strength as is found in ordinary boiler-plates; a specimen of the longitudinal joint has to show a percentage of strength at least equal to 74 per cent. of the solid plates, whilst a shearing of every plate used in the construction of the furnaces, combustion chambers, and tube-plates has to be cut 1½ in. wide, heated to a low cherry red, cooled in water, and then must stand bending in a process to a curve of which the inner radius must be one-and-a-half times the thickness of the plate tested.

These tests are certainly severe enough, but the steel can be made to stand even greater. Steel boilers have many advantages over those made of iron, not only in less fuel being required but in other ways as well, so their more general adoption is only a question of time. Steel wheels and wagons are now being made both in Sheffield and Barrow, and the competition for their manufacture is becoming keen. The wheels made in Sheffield have been tested on many occasions. In one instance a wheel was thrown from an elevation of 24 feet upon a solid block of iron seven times without showing the slightest sign of fracture. After undergoing the same ordeal twice more the wheel was only slightly fractured. Another test was again gone through even more severe. An attempt was made to break the wheel with repeated blows from a 16-lb. sledge hammer. The wheel was afterwards put in the smith's fire until it had attained a white heat, and then repeatedly struck with a sledge hammer, and was with the greatest difficulty broken, whilst an ordinary cast-iron wheel was broken with one blow of the sledge hammer. After this had been done a set of steel wheels and a corf were sent running down an incline with a fall of 6 or 8 inches to the yard, the corf being loaded with half a ton of pig-iron, and butted against a quantity of pig, which was broken by the corf without injuring the wheels. The result has been that steel wheels are fast superseding those made of iron, and that before long the latter will be almost unknown. In another direction Bessemer steel is also making rapid strides. For the best qualities of cutlery cast-steel has up to a recent period been used, and specially made for different grades at prices ranging from 25*l.* to 40*l.* a ton. Now, however, Bessemer it has been found can be made to meet the requirements of the cutlers, and at a much less cost. It will be seen a revolution is going on in connection with iron and steel, and that the latter is now making great headway, and is the metal of the day, for it appears there is scarcely one thing which is now made of iron but what can be produced in steel, and considering its

greater durability, texture, and appearance is in the long run far cheaper. Even in the existing depression in Sheffield there is probably more steel now being produced than was ever the case before.

## THE WORLD'S COAL AND IRON.

Mr. PECHAR, a German statistician, has been at the very great pains of analysing the production of coal and iron throughout the world in 1876. The proportion sustained by each of the principal countries of the globe in the production of coal and iron in the year in question is estimated as follows by Mr. PECHAR:—

| Country.             | Coal per cent. | Iron per cent. |
|----------------------|----------------|----------------|
| Great Britain.....   | 47.40          | 46.50          |
| United States.....   | 16.90          | 17.00          |
| Germany.....         | 16.90          | 3.33           |
| France.....          | 5.90           | 10.20          |
| Belgium.....         | 5.00           | 3.40           |
| Austria.....         | 4.70           | 2.80           |
| Russia.....          | —              | 3.00           |
| Sweden.....          | —              | 2.50           |
| Other countries..... | 3.20           | 11.27          |
| Total.....           | 100.00         | 100.00         |

It will be seen that, notwithstanding the enormous difficulties against which British industrialists have had to struggle during the last six or seven years, Great Britain still enjoys an unmistakable pre-eminence in the production of coal and iron. The fact is, these difficulties—arising as they did from the disturbed state of the labour market and the chaotic prices current for raw materials—were not exactly peculiar to Great Britain, but they also extended to France, Germany, Belgium, and the United States. If there have been countless strikes in this country since 1872 labour difficulties have also not been by any means unknown in the same period in France or Belgium. The result is that Great Britain is still a very long way indeed ahead of all competitors in the extraction of coal and the manufacture of iron.

There is one other observation which naturally arises when we come to dissect Mr. PECHAR's, no doubt, substantially correct analysis of the world's iron manufacture in 1876. We have more than once contended that it was rather the loss of American markets, and not Belgian competition, which has occasioned depression in some branches of the British iron trade since 1873, or, better still, since 1874, and we think Mr. PECHAR has conclusively proved our case. How can Belgian competition be a matter of very deep-seated concern to our ironmasters when Belgium only made in 1876 3.40 per cent. of the world's production of iron in that year? Certainly it may be said that 1876 is not 1877 or 1878, but we venture to affirm that the proportion sustained by Belgium in the general production of iron throughout the world has not materially varied since 1876, and this being the case it is impossible that the British iron trade can have sustained, as a whole, any serious injury from Belgian competition. No doubt there are some articles in which Belgian skill and perseverance have succeeded in obtaining an advantage over this country, but we can but think that the exhaustive analysis of Mr. PECHAR confirms our conclusion that Belgian competition in the iron trade has been very much exaggerated.

This remark does not, however, apply to American competition. That is tangible and real enough. Not only has the great development of metallurgical industry in the United States since 1872 had the effect of driving British iron out of American markets, but American ironmasters, having at the same time overdone their means of production, have been under the necessity of seeking external outlets for their products; and in Canada, South America, the West Indies, and even to some extent in Australia and New Zealand, the competition of American iron seems one of the contingencies with which we shall in future have to deal. It does not certainly matter very much from what quarter competition arises so long as it does present itself; still, it appears to us to be desirable that, in homely phraseology, our commercial writers should "put the saddle on the right horse." A knowledge of a disease is half a remedy for it; but to be of any value, knowledge must be precise and accurate.

## MINERS' ASSOCIATION OF CORNWALL AND DEVON.

The strenuous exertions made by the executive of the Miners' Association of Cornwall and Devon for the promotion of technical education amongst the miners and other workmen of the district, have frequently been referred to in the *Mining Journal*, and it appears that at the recent annual meeting a new scheme of affiliation was adopted by the council, which is calculated to render the advantages of the institution much more widely felt. The advantages of affiliation are now offered to all Science Classes in Devon and Cornwall where either of the subjects recognised by the Miners' Association is taught; and as the affiliation fee required from each class is but 5*s.*, it is probable that the privilege will be largely availed of. The Association retains the services of its paid lecturer (Mr. B. Kito), whose duty it will be, as heretofore, to preside over the Laboratory at Camborne, to carry on two classes in central positions, to open up classes in new districts, and to assist affiliated classes by occasional lectures, and by such advice as his experience may enable him to give. The subjects "recognised" are the following:—1, machine construction and drawing; 2, building construction; 3, mathematics; 4, theoretical mechanics; 5, applied mechanics; 6, acoustics—light and heat; 7, magnetism and electricity; 8, inorganic chemistry; 9, practical chemistry; 10, geology; 11, mineralogy; 12, principles of mining; 13, metallurgy; 14, steam.

By fixing the affiliation fee at so moderate an amount the charge for each pupil will be scarcely appreciable, whilst the advantages secured by affiliation are numerous and valuable. Among them may be mentioned the right to compete for the prizes offered by the Association, and which must not be estimated by their intrinsic value so much as by the value attached to them (by those by whom the students are likely to be subsequently employed) as evidence of the ability of those who have earned them in the subject to which they refer. The council of the Association have decided that pupils of the affiliated classes will be entitled—first, to the Miners' Association medal on reaching the required standard, and qualifying by working 12 months, at least, underground; second, to compete for the *Mining Journal* prizes, consisting of books to the value of about 15*s.*, one each in subjects 10, 12, 13, and 18; thirdly, the council prizes, consisting of books or mathematical instruments to the value of 10*s.*, one in each subject, to be awarded under the same regulations as the *Mining Journal* prizes, but not to such pupils as obtain the latter. The affiliated classes will likewise secure the advantage of supervision and occasional lectures from the lecturer to the Association, and every pupil of an affiliated class will be entitled to a copy of the Miners' Association report, to a discount of 20 per cent., in purchasing scientific works or manuals through the Association, to join in the annual excursion, to borrow books from the library, and to make use of the Association's laboratory under certain necessary regulations. The Miners' Association of Cornwall and Devon has already done a vast amount of good for a large number of young men in the counties in which it works, and it is not unreasonable to expect that this new arrangement will largely add to its prosperity and utility also.

ANOTHER COMSTOCK BONANZA.—The latest advices from the Comstock Mines state that exceedingly rich ore has been found in the Sierra Nevada incline in cutting out for the fills of the lower set of timbers. Specimens of black sulphurets have been found as pure and as rich as ever seen in the bonanza mines. The ore is without any intermixture of quartz; it is now pretty evident that the cross-cut on the 2200 level will disclose a bonanza of astonishing richness. Certainly the prospects have not been equalled by anything on the Comstock since the opening up of the 1500 level of the Consolidated Virginia in 1873. The ore assays \$300 per ton, proving conclusively that the ore is not only continuous but still holds its richness to that depth. The vein is computed to be over



200 feet in width. The south end of this new and splendid ore deposit is being approached as rapidly as men, powder, and machinery can accomplish the feat at three different points. In July the Sierra Nevada shares were selling at \$8 per share; the price is now \$250 per share. This represents an aggregate advance in market value of \$25,000,000 = 5,000,000.

**MINING ACCIDENTS IN VICTORIA.**—The report of the Chief Inspector of Mines—Major Thos. Couchman—for 1877 is decidedly satisfactory, although the number of fatal accidents was not quite so low as in 1876. The total accidents during the past four years have been 206, 275, 209, and 213 respectively, and have resulted in 90, 83, 65, and 64 deaths; and 245, 217, 170, and 154 injuries. Of the 213 accidents during last year 209 occurred in connection with gold mining, 2 in copper mining at Bethanga, 1 in the Walhalla Copper Mine, and 1 in a slate quarry in the Castlemaine district. Of the men killed 37 were married and left 148 orphans. Several ingenious safety-cages are described and illustrated in the report. Seymour's patent safety-cage and detaching hook has the peculiarity of having a hand lever, which can be operated by the men in the cage. Mitchell and Osborne's patent safety-cage is constructed with four gripping levers, one on each side of the two guides or runners in the shaft; the levers are supported by turned pins, which act as fulcrums for the gripping levers; the pins are rivetted to a piece of strong iron 4 in. wide by 1 in. thick, which is rivetted or bolted to the sides of the cage. To each end of the levers a rod is connected, which rods are at the upper ends attached to the wrought-iron beam fixed above the cage, and bearing the whole weight of the cage. Four steel springs are fixed to work on the top edge of the levers, to allow the gripping ends of the levers to open when the cage is suspended in the shaft or ascending or descending, when, should the rope break, the springs will immediately close the levers, and cause them to grip the guides or runners. Above each of the levers angle-iron stops are fixed to prevent the opening of the springs. Suitable buffers are provided to prevent shock. Mr. Thos. Cowan, the Mining Inspector for the Ballarat district, offers some suggestions which might be valuable elsewhere. He states that the relative situation of whims and shafts is about 16 or 17 ft. apart. The whim is usually of about 8 ft. in diameter, and the two pulley-wheels of about 18 to 24 in. diameter. The winding-rope, therefore, represents one side of a triangle, and it is found in practice that the shorter the space between the drum and pulley-wheels the greater the liability of the rope to slip off the wheels, and also to get entangled on the whim. He mentions the case of a miner in Ballarat East who was severely injured, and narrowly escaped death, through the winding-rope getting off the pulley-wheel, an accident that was most probably owing to the undue proximity of shaft and whim. He suggests that it should be made a rule that the axle of the whim should never be less than 15 ft. from the edge of the shaft. Another source of danger is, Mr. Cowan thinks, the insufficient length of the poppet-heads. The "shoe" of the rope being rigid cannot travel round a pulley-wheel 18 or 24 in. in diameter without danger to the rope. The "shoe" should never be permitted to reach the pulley-wheel at all, and to prevent this the pit mouth framework should be made so high as to admit the emptying of the buckets before the "shoe" reaches the wheel.

#### REPORT FROM CORNWALL.

Oct. 31.—This week is cheering indeed. The last rise but one in the tin standard was evidently a good deal more than a mere recovery. Now it has been followed by an advance which is really a gain, and now there is a far more healthy and hopeful feeling abroad than there has been—we may fairly say than we have known for months. At length there seems some prospect of demand overtaking production, and that without resort to any such desperate scheme as was proposed by the Spectator and its followers in utter ignorance of the facts—the stopping of the tin mines of Cornwall, or at any rate the greater number of them, in a voluntary way to allow Tasmania and Australia to obtain uncontrolled possession of the market. What is this precious proposal, which even deluded some unfortunate adventurers who ought to have known better, would have come to. The fight has been and is a stout one, but Cornwall is showing, as we always said she would, that she has more staying power than her competitors.

The Mining Institute, which has now been established little more than two years, and which has done excellent work at its meetings and discussions, and in every other practical way, will hold its second exhibition of mining machinery and tools next week. The exhibits are alike numerous and good, and the indefatigable secretary, Mr. Provis, upon whom the brunt of the work has of course fallen, is to be heartily congratulated on the result of his labours. The drills shown will include Darlington's new screw, Brydon and Davidson's, and the Eclipse. Messrs. J. Fenton and Sons, of Sheffield, will have every fine show of their crucible cast-steel castings, specially adapted for mining work where there is liability to great wear and tear. Mr. H. R. Marsden, Leeds, will send a small working model of a new patent stone-breaker, which has just obtained a gold and silver medal and an honourable mention at Paris, and which is really finding its way, but not by any means as rapidly as it ought, to our mines. Mr. Holman, Camberne, will exhibit one of his horizontal engines, and his ingenious sack packer. Mr. H. House has entered his patent low water alarm for boilers; a capital contrivance, and every way efficient. The Pulsometer pump, exhibited last year at Falmouth, will be shown in operation. Samples of their manufacture will be sent by the Warrington Wire-Rope Company. The Steel Heart Tool Company will have a number of novelties. The Neath Tin-Plate Decorating Company will forward an assortment of articles of tin-plate were adapted to a variety of uses, which have been under the hands of skillful decorators, and it is hoped may open a door to a fresh form of demand. Germany will supply a variety of engine and boiler fittings, blasting apparatus, and forges; America, as represented by the American Tool Company, a fine lot of tools; Belgium a quantity of zinc goods; and France a series of exhibits from the French Steam Pipe Covering Company. Other exhibits include asbestos and bare steam pipe covering from Messrs. C. Pope and Co.; steam packing and preparation to prevent corrosion from Messrs. Turner, of Rochdale; wire work, Mr. F. W. Weller; a water bed, Messrs. Powell and Co.; clay ornaments, Mr. Burlase; fire-bricks, Messrs. Brier and Musgrove; water tests and valves, the London Water Purifying Company; instruments, Mr. Gifford and Mr. Newton; and products, the Kennal Vale Company. There will likewise be a large miscellaneous art and general exhibition.

The Miners' Association is about to set to work on a new plan, in accordance with the resolve of the late annual meeting. Henceforth the special subsidies given to a certain number of district classes are to be discontinued, but in lieu the advantages of affiliation, on payment of a fee of 5s., are offered to all science classes in Cornwall or Devon, in which either of the following subjects are taught:—Machine construction and drawing, building construction, mathematics, theoretical mechanics, applied mechanics, acoustics, heat and magnetism and electricity, inorganic chemistry, practical chemistry, geology, mineralogy, principles of mining, metallurgy, and steam. The advantages of affiliation are numerous. Pupils of the affiliated classes will be entitled to compete for the Miners' Association medals and prizes, including those offered by the Editor of the Mining Journal. They will also have the advantage of superintendence, and occasional lectures from Mr. Kitto, F.G.S., the lecturer for the Association, and to make use of the laboratory at Camberne under his directions. The other advantages include the receipt of 25 per cent. on the purchase of books, the right to join in the annual excursions, and borrow books from the library. Mr. Kitto will continue as heretofore to preside over the laboratory at Camberne, and will conduct two central classes. He will also open up new classes in new districts, and render general assistance to affiliated classes. In order to affiliate teachers and secretaries of science classes should make application to Mr. J. H. Collins, F.G.S., of Truro, honorary secretary. It is to be hoped that the new departure will not only place the Association on a better, because a less strug-

gling, basis, but be the means of widely extending the great advantages which it has to offer.

Your correspondent, who asks for information concerning elvan, is not likely to have met with one in the Isle of Man. Probably what he refers to is a hard trap dyke. Elvan is a local Cornish term applied to a series of rocks which are peculiar to granitic districts. De la Beche describes the elvans as "long lines of granite and felspar, porphyritic rocks cutting the slates and granite, occasionally traversing both in one continuous body of rock, which in their general mode of occurrence strongly remind us of trap dykes, and from which they chiefly differ in mineral composition." Mr. J. H. Collins, in his excellent "Mineralogy of Cornwall and Devon," defines elvan as "a Cornish name applied to the porphyritic dykes which intersect most of the mining districts. Many of them are highly felspathic, and some contain disseminated crystals of felspar quartz, schorl, penite, and other minerals." To a large extent they may be considered as granitoid rocks of later date than the great granite masses. Except in the dyke-like manner of their occurrence they have no one character which may be regarded as invariable. Though commonly felspathic they differ widely in composition. While some, too, are distinctly porphyritic, and others more obscurely crystalline, others again are even-grained, and some in hard specimens would not be easily distinguishable from a sandstone. They are found of all hues, from dark blue, grey, and brown, thorough rose colour even, and green, to almost pure white. They differ as widely likewise in hardness. Some are among the hardest and toughest rocks with which the miner has to deal; others are so softened by decomposition that they are worked as clay. All things considered, therefore, it is about as hard for the uninitiated to know elvan as it is for an unskilled miner to "know tin," nor is it very easy to give your correspondent any more definite means of solving the problem which he has set himself. He may very safely take it for granted, however, that there is no elvan, in the true sense, in the Isle of Man.

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Oct. 31.—There is little to report that is new this week as to the condition of the iron and coal industries of this district. Trade is certainly no worse than it was. Prices have a tendency to strengthen, and people who here and there had been withholding orders, are placing them. The sheet-makers are as well engaged as most producers, and among the foreign enquiries which just now they are meeting with are some from Russia. From 77. 10s. to 82. 10s. is the price of sheets (singles); slit rolls are in good out-turn for China and Japan. The plate makers are inactive. The competition in the pig-iron trade is not diminished, and sales are difficult to secure. Coal is not improved in demand from the furnaces, but for household purposes a little more is doing.

The district remains disturbed upon the important question of the colliers' working hours; the men seem more and more determined to resist any alteration. They would evidently prefer a drop in the already low rate of remuneration if this were made imperative. Whether the Earl of Dudley will reduce the price of his furnace coal and so compel the men, under the present agreement, to work for less remains to be seen. It is considered unlikely that his lordship will pursue such a course now that the winter quarter has commenced. The trade is awaiting somewhat anxiously the adjourned conference of masters and men next Tuesday.

The ironworkers are, to say the least, acting most in discreetly. At a meeting at Brierly Hill, on Monday, after listening to an address by Mr. Capper, the operative secretary to the Board of Arbitration, they passed a resolution that "The late award was not given in accordance with the weight of evidence." The operative members of the board were further instructed to "at once give the requisite notice for the reconsideration of the wages question; and that with the view of securing an increase of wages they should urge upon the employers, if needs be, to advance the selling price of iron." What good the ironworkers can possibly expect to get by pursuing such a course as this it is difficult to see. It is out of the question that if the wages matter were to be reconsidered, any other decision than the one already given by Mr. Chamberlain, M.P., would be come to, and the idea of raising the price of iron at a time like the present is preposterous.

The colliery owners in the Cannock Chase district have given their men, to the number of 7000, notice for the expiration shortly of their present working contracts, with a view of a reduction in wages, probably to the extent of 6d. a day.

At the second general meeting, on Tuesday, of the Darlston Coal and Iron Company (Limited) the directors presented for adoption a scheme for raising 65,000l. additional capital on new debentures. The money is required, 22,277l. for paying off the first mortgages, 13,000l. for developing the collieries, 20,000l. for laying down a Siemens-Marten steel plant, and the residue for other purposes. The scheme was opposed by the present debenture holders, and a committee of shareholders was appointed to discuss the scheme with the directors, the general meeting being adjourned for a fortnight.

Messrs. A. Kenrick and Sons, West Bromwich, have received notice that their firm has been awarded a silver medal at the Paris Exhibition. In the British official catalogue, just published, it is incorrectly quoted as a bronze medal.

Liquidation by arrangement has been resolved upon in the matter of the failure of Mr. Bernard P. Walker, Eagle Ironfoundry, Birmingham. The statement of affairs showed liabilities 16,818l. and assets 7980l. The debtor told his creditors at the meeting that he had no capital, and that, therefore, being thoroughly helpless, he was unable to make any composition offer.

The demand for finished iron in North Staffordshire is curtailed. Hoops and such small sections are most enquired after, mainly for local consumption. Heavy iron for engineering purposes is sadly inactive. Prices are generally firm.

Mr. James Young, manager of the Slattenfield Colliery, Harecastle, has been fined 5l. and costs for providing insufficient bratticing. The charge was of providing insufficient ventilation. Mr. Wynne, the Government Inspector, deposed to the dangerous nature of the seam and the inadequacy of the ventilation, but it was urged for the defence that every precaution had been taken to protect the lives of the men employed in it. Competent men were employed to examine the pit night and day, and whenever there was reason to suspect the existence of gas increased precautions were taken. There was adequate ventilation for all ordinary purposes, but on the day in question there was a sudden fall of roof, which interrupted the current of air. This was a circumstance which could not be guarded against, and for the consequences of which the manager could not be held responsible. In cross-examination Mr. Gilroy, the assistant Inspector, said the principle of ventilation was a correct one, and if the quantity of air had been in accordance with the principle there would have been sufficient ventilation to clear the gas, but in this particular place there was no "bratticing," and there was no means of carrying a current of air to the part where the men was working. The Bench were of opinion that the system of ventilation was sufficient, that the presence of gas was due to the fall of roof, and that as soon as the accident occurred precautions were taken to withdraw the men. So far there was no blame to be attached to the manager, but the bratticing was insufficient, and to this extent there was negligence on the part of the manager.—A penalty of 5l. and costs was inflicted.

The Casson-Dormy puddling machines, which are in operation at the Earl of Dudley's Round Oak Works, at Brierley Hill, have been now some time before the public. Mr. E. Fisher Smith, the Earl of Dudley's agent, having read a paper on the subject before the Iron and Steel Institute in 1876. The furnaces are highly spoken of by practical men, and are calculated when trade revives to do something to obviate one of the difficulties which must spring up through the scarcity of underhand puddlers, seeing that puddling is done by mechanical means. Mr. Casson's machine differs from the ordinary form of puddling furnace in that it is a gas producer instead of a gas consumer. The puddling chamber is perfectly circular in form. In lieu of a neck a chamber is built for the preparatory heating of the pigs, and mechanical is substituted for hand puddling. The circular basin enables the rubbing to be done easily by machinery. The iron produced is of a much superior quality to

that got out by the old hand puddling system, and in addition there is the great desideratum that the cost of production is less, there being a saving in coal, fuel, castings, and bricks. Slack can be used instead of forge coal, and every particle is utilised. Thus if the days of the manufactured iron trade are not speedily drawing to a close, as some of the members of the Iron and Steel Institute at their meetings declare that they are, we may expect to have a good deal of the Casson-Dormy furnace when trade revives.—*Wolverhampton Chronicle.*

#### REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Oct. 31.—Notwithstanding some recent symptoms of revival, the depression in the Slate Trade is making itself felt in the larger quarries, and in consequence of the large accumulation of stock notices have been issued to the men at the Penrhyn Quarries of a reduction in wages of from 20 to 25 per cent., which is to date from the letting of the bargains to-day. A reduction has been anticipated for some time past, and it is said agreed to by the quarrymen's Union. Still, the reduction is a heavy one, and disproportionate to the fall in the price of the article. A reduction of time worked would, in the opinion of some of the men, have met the case better. It is probable that a reduction of wages will follow at all the slate quarries. The Coal Trade keeps depressed, and there are accumulations of stock at most of the collieries.

The colliers at the New British Iron Company's Green pit have availed themselves of one of the provisions of the Mines Regulation Act by choosing four of their number as inspectors of the workings of the colliery. Last week two of these inspectors examined the workings in the Main and New coals, and two of them those in the Lower Yard and Wall and Bench coals. Both parties gave satisfactory certificates as to the excellence of the roadways, ventilation, &c. A fatal accident occurred through a fall of the roof at this colliery, whereby a collier lost his life.

The prosecution by Her Majesty's Inspector, Mr. Hall, of Mr. Pryce, the manager of the Brynmally Colliery, in connection with the late fatal explosion of gas in the Lower Yard seam in that colliery, has failed, the principal colliery engineers and managers of the district concurring that the arrangements for ventilation were as good as could be desired. That Pryce had done all that any of them should do; that he was a most careful manager, and that the accident was due to a sudden outburst of gas that could not be foreseen, and that if any blame were attached to anyone it was to the fireman. Mr. Pryce was discharged. Mr. Dennis, mining engineer, added in his cross-examination that the plan submitted by the Government Inspector as the proper one for ventilation was "the most absurd thing he had ever seen." Although there is generally a desire to find a victim on such occasions, much satisfaction is felt in the district that this prosecution has failed.

A compulsory order, on two petitions, has been made for the winding up of the Ruabon and North Wales Collieries Company (Limited). This company must not be confounded with the Ruabon Coal Company, from whose collieries those belonging to it are distant about eight miles. The North Wales Carriage and Wagon Company, whose works have not long since been established, near Mold, is also to be wound up.

The extensive works formerly erected for the Potteries and North Wales Railway are now occupied by the Midland Wagon Company, and present a more lively appearance than they have done for many years past. Additional sheds are also being erected.

At the Old Grosvenor Lead Mine on Halkyn Mountain, Flintshire, a good discovery of ore, which occurs in large lumps, has been found in driving towards the Wagstaff lode, and it is thought the quantity of ore will increase as the junction with that lode is reached.

I have read with some interest Captain Abalom Francis's report—out of the stereotyped groove—which appeared in last week's Journal, upon the British Silver-Lead Mine, near Festiniog, but I wish he had explained what he means by the "primitive strata" and primitive formation.

I was glad to read the report of the sale of a parcel of lead ore, with the rich proportion of 34 ozs. of silver to the ton, from Court Grange Mine, and trust the supply may be kept up both in quality and quantity. I gladly hail every sign of improvement in the northern part of Cardigan, where such improvement is much needed, for we cannot go on for ever paying rates and taxes out of the records of successes of Hugh Myddelton and Mr. Bushell.

Mr. Isaac Williams, of the Trevel Limestone Quarries, near Llan-gollen, a good and intelligent man, long connected with colliery and quarry operations, died last week, aged 64. He will be missed by his family and by many friends.

#### REPORT FROM DERBYSHIRE AND YORKSHIRE.

Oct. 31.—Mining operations in Derbyshire go on much as usual, those in the lead districts being carried on in a quiet and unostentatious manner, and the villages bear none of those peculiar marks that distinguish the residences of coal miners. A fair quantity of lead is being raised, and there is every appearance of its increasing, although the low prices of lead are no great inducements for working it. The demand for iron ore has fallen off, owing to some of the furnaces being damped out, consequent on the slowness of the trade and the very low price at which pig has to be sold. It was thought a short time since that the worst had been got over, and that a better state of things had set in, but this was but a momentary delusion, for things have got from really bad to truly worse. Pig has been sold without profit, and even then the sales were not easily effected, so that the blowing out of some of the furnaces is only what may be expected as the natural outcome of such a state of things. The foundries are also worse off than they have been, for at Staveley, where the men have had a long and uninterrupted run of comparative prosperity, a number of hands have had to be discharged in consequence of slackness; but this is not likely to be of more than a temporary depression, seeing that the company has a reputation of no ordinary kind for many kinds of castings, the Staveley Works being known all over Europe, whilst at home there has generally been a heavy demand for the pipes, pillars, and cylinders made at the foundries. At Sheepbridge there has also been a decrease in the trade, necessitating the lessening of the production of pig and the reducing of the staff of workmen. No falling off, however, has taken place in the business doing in Bessemer rails, for the output is kept up to the full standard.

In most parts of Derbyshire the collieries have been working very well, all things considered, but the prices received at the pits are not of a profitable character. It is true that a good trade is being done with the Metropolitan, where prices are now better than they have been during the previous part of the year, but nearly the whole of the extra charge goes into the pockets of the merchants, who make the prices lists to suit themselves. Not much is being done in steam coal, not much being shipped from the Yorkshire or other ports. In other qualities there has been no material change either as to the business done or as to prices. It is said that at the Shire-oaks Colliery, the lessor of the coal being the Duke of Newcastle, the men have been asked to submit to a reduction of their wages to the extent of 10 per cent., but the decision comes to, if any, has not been made public.

In Sheffield trade appears to have got worse, for many men are now walking about idle, and some of those parties who only last week submitted to a reduction of wages. The mills are quieter than usual, so that puddlers, shinglers, and others in the same line at several places are not fully employed. In plates for ironclads and land batteries the business has declined, as the orders from our own Government have been gradually finished off. In ordinary plates the mills have been running tolerably well, but the recent failure on the Clyde and some others that may follow have some effect upon our production, for it is to be feared we have not got to the end of the disasters resulting from the failure of the Glasgow Bank. General cutlery does not go off at all well either for the home or foreign markets, our own colonies being still about our best customers for steel goods of a varied description, as well as for rails of the same material. A steady business continues to be done in malleable iron, which is now used for many purposes that steel was considered to be necessary for, and it is now bought out in fine castings ornamental and otherwise equal in finish and even more tenacious than the best steel. Bessemer steel, in addition to the large quantity absorbed by the rail mills, is now being used for the making of cut-



very, for which a short time since cast steel only was used. Best Bessemer steel, it appears, by careful manipulation and precision in the quantity of the various ingredients used, can be made suitable for almost any purpose, and, of course, at a much less cost than cast steel. In the Attercliffe and Rotherham districts the works are going along steadily, more especially those engaged in rails, whilst there is a fair output of light plates, hoops, spades, shovels, nails, &c. Some of the brassfounders are rather better off in taps and plumbers' work. In the Sheffield district the collieries do not appear to be quite so well off as those a short distance off, but taking South Yorkshire altogether the miners are very fairly employed, for there is now a steady demand for house coal, and an increased business is doing with the Metropolis. Prices, however, have not much altered, although, as a rule, they are a trifle better than they were a short time since. Up to the present time the exports of steam coal from the Humber have kept up fairly to the North of Europe, but the season cannot last much longer. Hull, it may be said, is principally supplied from West Yorkshire, the rate being lower from Normanton than from Barnsley and the district. South Yorkshire, however, provides a larger proportion of the coal exported from both Grimsby and Goole. A good deal of coke is being made from small coke in the neighbourhood of Barnsley, and is sent into Lincolnshire and other districts for iron smelting and other purposes.

#### REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

Oct. 31.—Now the associated masters have resolved to organise immediately a permanent relief fund for miners, and they have appointed a committee to meet the men to arrange final particulars. A meeting has been held at Cardiff, and influentially attended, for the purpose of supporting the scheme. The High Sheriff of the county presided. The Abercarn Explosion Fund has reached the total of 55,000l., and the fund has now been closed. The position of the Iron Trade has not materially altered for the better, and there now appears to be no likelihood of an improvement during the present year. The demand for rails is not brisk; in fact, it seems gradually on the decline. Not so steel rails, which continue to be in good request, but at prices scarcely above those for iron. Bars are in rather limited request, and there are no orders of any magnitude on hand. Pig-iron is a shade easier. Clearances during the week have been rather larger, several good shipments being made to Maryborough, Kurachee, and Lytleton.

The steel trade, as above intimated, is fairly active. Nothing fresh can be stated with regard to the tin-plate industry. The Coal Trade is not quite so brisk this week, and shipments have been rather smaller. The demand for steam qualities have been fairly well maintained, but prices are exceedingly low, and yet competition to sell continues very keen. The output, too, has not diminished. For house coals there is a rather better enquiry, although this branch of trade continues somewhat dull. The patent fuel department is very quiet. Freights are rather firmer.

#### TRADE OF THE TYNE AND WEAR.

Oct. 30.—There is not much change in the condition of the Coal and Iron Trades. House coal improves a little, but all other branches, even including gas coal, are entirely devoid of animation. This is a curious circumstance the state of gas coal at this season, but it is supposed that the consumers have bought largely during the past six months, and accumulated considerable stocks. There is little improvement in steam coal north of the Tyne; only the best works are fairly employed. The steam coal-owners have given notice to the mechanics employed that they wish to make a reduction of 7½ per cent. in their wages, and also that they return to the ten hours work per day. The Northumberland steam colliery-owners have also determined to make a demand of a reduction of 12½ per cent., and also request the miners to add one hour to the time per day's work, the object of this being to enable the men to do more work, and also to cut the coal more carefully, so as to produce as much as possible of round coal; and there is no doubt that those changes are necessary to allow the masters a chance of competing with other districts. The men will make some difficulty in accepting the conditions offered; the masters appear to have the awkward habit of presenting more than one bitter pill to be swallowed at one time, which is scarcely good policy, but in spite of this the men can hardly stand out at present against them. It is evident that the masters must have a reduction of rates, and the men require more time to enable them to produce good saleable coal. In Durham the house coal trade is improving, and the works producing first class coal of this sort are fairly employed, but most other works are on about two-thirds time. The Oakeshaw Colliery, another of Messrs. Straker and Love's Auckland Collieries, is to be stopped, owing to the falling off in the coke trade. A dispute has occurred at the Houghton Colliery, the men having asked for an advance of 10 per cent.; the masters refused to refer this to the Joint Committee of Masters and Miners, and also gave notice that unless the terms be accepted by the men the main coal will be closed. In the present state of trade it is absurd to ask for any advance in prices. At Wardsley Colliery part of the men have come out owing to a proposed reduction on one side of the colliery, although the men have been earning considerably more than the county average wages of late. This will not cause any serious inconvenience, as more coal can be got from the other districts in the pit, and the usual trade will be nearly supplied.

The iron trade is in a most wretched state, the commercial failures at Glasgow having administered another blow to a trade which was at the lowest possible ebb previously. At Middlesbrough on Tuesday the market was quieter than has been the case for many weeks. No trade appears to be doing which is worth taking into account. This arises in a great measure from a lack of confidence, and also from the fact that purchases were made a few weeks since by many of the consumers which would carry them over the autumn season. The quotations vary considerably, though makers are asking more, their rates practically for No. 3 are 38s. less one, but merchants are doing the same quality of iron at 6d. to 9d. per ton less. Makers are at about 37s. 6d. for No. 4 forge. The effects which have been anticipated with regard to the Scotch trade in Cleveland pig-iron have already been shown. Last week only about 3200 tons of pig metal were forwarded from the Tees or Scotch, less than half the delivery for the corresponding week of the previous year, and considerably below the average. Serious fears are entertained that this is only the beginning in the falling off of the Scotch trade. The Cleveland ironmasters are obtaining one advantage for which they have long striven—a concession of 7½ per cent. from the North-Eastern Railway Company in the charges on mineral traffic. This reduction will bring the railway charges to about the same point as they were six or seven years since, and will be a considerable relief to the trade in its present depressed condition. The wages question is shortly to be brought before the board of arbitration for the manufactured iron trade. The reduction of 5 per cent. is not taken in a very pleasant spirit by the men. The manufactured iron trade has kept dull, and taking the district through the prospects are not quite so good. We hear of angle and rail mills being laid off. The steel trade is, however, flourishing. The prices of manufactured iron show a rather downward tendency. Common bars can be obtained for 54. 7s. 6d., we have heard of them being done for even less. Angle iron remains at about 54. 10s. Ship-plates are 64. to 66. 2s. 6d., less 2½ per cent. The ironfounders are, with few exceptions, fairly employed for the present. The coal and coke trades show a rather better feeling, and there is an increased demand appearing.

Last week the employers connected with the Board of Arbitration for the North of England iron trade decided to give notice from Nov. 30 of a reduction of 6d. per ton on puddling and 5 per cent. on forge and mill wages. The operatives are likely to strenuously resist the reduction, as they state it will bring them 61. per ton below the Staffordshire wages, and will be a lower price than they have before worked at. The question it is, however, believed will be submitted to an arbitrator in due course.

We have often noticed the question of mineral rates charged by the North-Eastern Railway Company, and this subject was brought

prominently before the directors of this great system a short time ago. It is pleasing to note that the result of the application has been that the directors have decided to make a reduction of 7½ per cent., to take effect from Nov. 1.

The Chemical Trade is more animated during the past week than for some time past. Bleaching powder has been in especial request, and some large sales have been effected. Prices, though very low, are steady, and as continental buyers are coming in prices will soon advance unless prevented by the ruinous competition amongst makers and speculators.

A general meeting of the North of England Institute of Mining and Mechanical Engineers will be held on Saturday, when a paper will be read—"An Account of some Recent Experiments with Coal Dust," by Professor A. Frere Marico, M.A., and Mr. D. P. Morison.

#### REPORT FROM THE FOREST OF DEAN.

Oct. 31.—The Coal Trade, on the whole, may be said to fairly maintain the recently reported improvement, although it cannot even now be said that the colliers are fully employed, nor are the wages of the men satisfactory. There are serious alleged drawbacks in the arrangements at most of the collieries, which, it is alleged, so interfere with and obstruct the men in their operations that the consequence is in many instances low wages to the workmen. But as coal is cheap, and, therefore, profits at a minimum with the proprietors, workmen can hardly expect to receive such wages as would give them entire satisfaction. The effects of severe competition in trade must in fairness be borne in part by the industrial classes, and not all by the capitalists, who invest their money often at a considerable risk. Under these circumstances we deprecate an attempt that is just now being made to restart the Miners' Union, conscious, as we are, that the strikes and frequent disputes of recent years did much to bring about the prevailing depression in trade. We hardly think, however, that much success will attend the effort now alluded to, as men must have had their eyes opened to a large extent that the noisiest agitators did not always aim at the benefit of the men, but acted largely on the "number one" principle.

Colliery proprietors appear to be looking forward with much interest and hope to the completion of the Severn Bridge, as likely to materially advance their interests by giving a considerable impetus to the coal trade in this district. This expectation is not an unreasonable one, seeing that outward bound vessels may legitimately be expected to avail themselves of cargoes of coal instead of carrying ordinary ballast, as the principle of loading both ways means profits to the shipping interest outward and inward, whereas no profit comes from mere ballast. Viewing such probabilities, it yields a good deal of satisfaction to know that the said bridge is rapidly advancing towards completion, so that in a few months we shall have the pleasure of seeing it opened for traffic. The railway interest within the Forest is quietly though surely advancing its facilities for public convenience.

The Great Western is pushing on the junction line which is to connect the Forest interior with the Gloucester and Hereford line, and the Severn and Wye Company is also pushing on its approaches to connect their system with the Severn Bridge; and the company is also just establishing a goods delivery at Cinderford, from the new station near the Dam. The Tin-Plate Trade is thought to have passed its worst, and that the prospects are more encouraging than a little time since. Mr. Chivers's new tinworks are in a forward state, and hopes are entertained that they will be started early in the new year. The Iron Trade is still dull, and in consequence of this dulness the conversion of the Sawdley Works to the manufacture of steel is deferred.

Since our last report we have made special enquiries respecting the sewage tanks, and the complaints respecting offensive odours and fish poisoning, and the result is we are persuaded that a good deal of misconception and misrepresentation exist on the subject. The worthy inspector of nuisances, to test the value or otherwise of the complaints, took several bottles of the water from the brook at different places above the sewage works (tanks) and below them, including a specimen from Mr. P. Constance's millpool, into which the water runs after it has left the sewage works. Mr. Constance's mill is below Sawdley, and from the tanks perhaps three-quarters of a mile. Mr. John Cooper lives at Sawdley, and has property there; those two persons are the individuals who are making the complaints, and threatening legal proceedings against the local authorities. It is admitted that an odour escapes when the precipitated sewage material is being removed; but as to the stream being polluted, it does not appear from the analysis of the water that any just grounds exist for such a statement. But with a view to deal more effectually with the sewage matter, it is proposed to erect a new tank at a cost of about 900l., and an application has been made to the Local Government Board for its sanction, and in due course an answer will come to that application.

We have been favoured with a copy of the chemical analysis of the specimens of the water from the Sawdley brook, and as its publication may be interested we append an abstract of it to our report, observing that the analyst was not aware of where the water was taken from, as the references were not supplied further than the letters for a key for reference here in the Forest, so the analysis is uninfluenced by local considerations, and is a chemical one pure from prejudice. The sewage works are at Cinderford, but the outfall and tank are between Ruspedge and Sawdley. The samples were all taken on the evening of August 14, a pint bottleful being sealed and signed in each case by W. Spence and Alfred Ridler. These bottles were received by Prof. C. Meynert Tidy, M.B., professor of chemistry at the London Hospital on August 16, and analysed by him. A—taken from the stream at the wooden bridge near the head of Mr. Constance's pool at Sawdley, at 7.30 P.M. was turbid, but odourless, and yielded 27.02 grains of solid matter, 0.009 ammonia, a trace of nitrogen as nitrates, 0.448 of organic matter, and 1.65 of common salt. B—taken from the stream about 120 yards below the sewer outfall at 8.10 P.M.—was turbid, but odourless, and yielded 30.04 grains of solid matter, 0.060 grain of ammonia, 0.060 grain of nitrogen as nitrates, 0.472 organic matter, and 1.77 of common salt. C—sewer effluent taken at 8.25 P.M. was turbid, and of a very offensive order, and yielded 54.2 grs. solid matter, 2.36 ammonia, no nitrates, 7.712 organic matter, and 12.033 common salt. D—water being pumped from Shakermanton Works, taken at 8.45 P.M. was turbid but odourless, and yielded 19.6 grs. solid matter, 0.002 ammonia, 0.060 nitrogen as nitrates, 0.336 organic matter, and 1.54 common salt. E—taken from the stream of the railway bridge above Shakermanton Works at 9 P.M. was turbid, but odourless, and yielded 43.4 grs. of solid matter, 0.001 ammonia, 0.036 nitrogen as nitrates, 0.940 organic matter, and 1.65 common salt.

NEW ZEALAND KAPANGA.—The report in another column appears to be satisfactory as far as the developments had proceeded from re-opening the mine to date of the letter. The result of the crushing is exceedingly good, and, besides the known shoots of ore in the vein, it would seem that the agent is in expectation of cutting others, from the exploratory work mentioned as having been commenced.

With reference to the petition which has been filed by a small shareholder for winding up the Malpas, Rica, and Malabar Gold Washing Companies, we understand that an overwhelming number of the shareholders are in favour of the dismissal of the same. It is believed that the new and deeper opening on the bottom of the channel where rich gravel is known to exist now being made in the Malpas deposit will satisfactorily solve the question as to the value of the property, and those most largely interested are determined to carry it through.

PARIS EXHIBITION, 1878.—The Anglo-American Rope and Oakum Company, Liverpool, have received the Highest Award for Prepared Oakum (manufactured and spun by machinery).—Liverpool Mail.

It is announced by the official liquidators that the creditors of the Oakham Collieries Company can now receive the dividend of 5s. in 11., payable under the scheme for the reconstruction of the company.

## THE LAMORNA HARBOUR AND GRANITE WORKS (LIMITED).

Incorporated under the Companies Acts, 1832 and 1867, By which the entire liability of each shareholder is strictly limited to the amount of each share.

Capital, £25,000, in 2500 shares of £10 each, to be paid as follows:—

£2 10s. on application, £2 10s. on allotment, and the remainder in two equal parts, at three and six months from date of allotment. If no allotment be made, deposits will be returned in full. Of the above shares 1500 are offered for public subscription.

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DEVEREUX BUILDINGS, 214, STRAND, LONDON, W.C.

This company has been formed to purchase, from W. H. Owen, Esq., the lease and freehold lands of the Lamorna Harbour and Granite Works, and the directors have pleasure in presenting to the public a property of a non-speculative character, in working order, and ready to make immediate profits.

The Lamorna Harbour property, situated at Lamorna Cove, on the south coast of Cornwall, about 3½ to 4 miles from Penzance, comprises about 20 acres of leasehold land, and also a small portion of the shore as is sufficient for the pier (which forms the breakwater) and harbour. The harbour is formed by a wharf, 194 ft. in length, and a cross jetty or pier 129 ft. in length. On this land the granite quarry has been opened and worked, and is now clear and in working order. There is also a stone built carpenter's shop, and lime and mill house, containing a revolving mill for grinding lime, driven by an overhead water wheel, equal to about 12-horse power, which may be increased, and is applicable to any purpose, such as machinery for polishing granite, or for a saw-mill or bone-mill, or any other purpose for which milling power may be required. Beside the mill house, and under the same roof, is the carpenter's shop, with a loft over, and at the back a yard capable of storing about 500 tons of coals. Above, and by the side of the stream of water which supplies power to the mill, is a small meadow of about three-fourths of an acre, capable of being used as a timber, coal, brick, and tileyard. The stream is pure and clean water, and has a never failing supply.

The harbour is capable of receiving vessels of up to 80 tons burthen, and may be doubled in capacity at a very trifling expense.

The granite is of undoubted quality, and obtainable in any quantity and of any reasonable size, and is suitable for every purpose to which granite is applicable. It has been already extensively used for lighthouse building on the present Longship lighthouse—a sufficient proof of its quality.

The demand for granite (especially of the Lamorna quality) is very great, and a large and profitable trade can be confidently relied on.

As proof of the quality of granite in this neighbourhood, it may be stated that on the opposite margin of the Cove there is a large granite quarry, which has been worked at a considerable profit for many years, even with the great disadvantage of having to send all the stone to Penzance for shipment, involving loss of time and great expense for land carriage and harbour dues, expenses from which this company will be entirely exempt. The stone from this neighbourhood has been extensively used in New Government Dock and other works.

The property has been in abeyance and the quarry unworked to any extent for a short time past owing to the death of one of the late owners, and delays (unconnected with the property) having occurred in winding up his estate; but the whole, with the working plant, has been carefully upheld and retained in good order and condition, and considerable sums have been recently laid out in completing the buildings and preserving the plant, all of which are now in excellent working order.

On the cliff, in a high position immediately overlooking the harbour, and within almost speaking distance, stands a substantial stone-built, six roomed dwelling-house for a foreman, and about 300 yards from the sea is a spacious and handsome dwelling house, with a large room (originally intended for a Chapel of Ease or school room). This house is well and expensively built, and is capable of being utilized (for instance) as a marine telegraph station or terminus, for which, in point of both capacity and position, it is eminently adapted.

The portions thus far enumerated are leasehold for a long term, at an almost nominal rent, of which about 30 years are unexpired. Royalty, 61. per ton. Besides these, there is a freehold cottage, with large garden; also about 3 to 4 acres of freehold land, bounded on one side of its whole length (nearly a quarter of a mile) by the stream of water which has been mentioned. On this land stands a new and perfectly well-built coach-house and stable, with man's room over, erected within the last three years. Portion of this land is cultivated, and adjoining (separated only by a mill race) are 6 acres more of freehold land, either as building land or for mining purposes, the whole of the 6 acres round the country being rich in copper and tin.

There is a large demand in the neighbourhood for agricultural manures, lime, timber, slate, bricks, drain pipes and tiles, and more than all for coal and fuel, none of which is now procurable except by means of expensive and difficult carting to Penzance; and the locality is eminently fitted for the establishment of a large factory or manufacturing premises for any of the many products of the present day—such, for example, as a paper factory, being well supplied with water power, and the advantages of the locality for any trading purpose are such as would render successful competition impossible. The freehold land is admirably adapted for the erection of smelting works.

There are about 40 tons of limestone of the best quality imported from Plymouth now on the works sufficient for commencing operations, and oil, coal, and other materials being brought from Wales in about a week.

The civil engineer's report states that there are about 200 tons of stone already quarried ready to ship in rough, or to be worked for use.

The whole has been minutely inspected and examined by Richard B. Grantham, Esq., Civil Engineer and F.G.S., No. 22, Whitehall-place, London, whose report is appended.

The following table of estimated profits has been compiled with great care, in which the profits are put at the lowest possible figure, whilst the expenses are calculated at the highest.

The cost to the company of the entire property, consisting of freehold and leasehold lands, buildings, plant, machinery, &c., with all rights and privileges is £15,000, £2000 of which has been taken in fully paid up shares.

No promotion money of any kind has been or will be paid.

The only contract entered into is one for the purchase of the property, between William Henry Owen, of the one part, and George Wreford, as trustees on behalf of the company, of the other part, dated the 28th of September, 1878. A copy of this contract, with certificate of registration, and copies of the Memorandum of Association, plans of the property, and original report, may be seen at the offices of the company or at the solicitors.

STATEMENT OF PROFITS

Which may be expected, and which statement is based on the actual prices paid for the stone from this quarry by the Trinity House for the Longship Lighthouse.

—Dressed ashlar, at 4s. 6d. per cubic foot; scapell, 1s. 11d. and small, 1s. 6d. per cubic foot. Of these prices one-fourth are net profit, which gives an average (omitting fractions) of 9s. 6½d. per ton.

Then, with a delivery of only 120 tons per week (which is a small computation) the result is 120 tons, at 9s. 6½d., making £57 10s., which for 52 weeks is £2976 10s.

N.B.—This delivery might easily be trebled, and the amount of the output is limited only by the labour employed.

Lime—say, 20 tons per week—at a moderate profit of 2s. per ton, is £2000 per week, which for 52 weeks is £104,000.

Nor is the burning of lime limited to 20 tons per week, for there is abundant space for more lime. When lime was available here it was found that the demand always exceeded the supply. Moreover, in point of quality, nothing equal to or even in the vicinity of Penzance, and it was in great demand.

Coals offer a prospect of delivering at least 100 tons per week, and would yield a probable profit of 5s. per ton, which for 52 weeks would be £260,000. Besides which there is a demand for slates, bricks, tiles, and drain-pipes, and such like things, which would, at a very moderate computation, yield a further profit of (say) £10,000.

Giving a total of £2976 10s. + £104,000 + £260,000 + £10,000 = £345,766 10s.

Deduct—Salaries, office expenses, &c. (say) £2500

Leaves £343,266 10s.

(N.B.—Costs of labour and royalty of 6d. per ton have been allowed for in the calculation of above profits.)

Sufficient to pay interest on a paid-up capital of £25,000 at 12 per cent. £6250

And leaving a surplus of £337,016 10s.



This moderate estimate shows a profit sufficient to pay a dividend of 12 per cent. on the entire capital, and will also allow 2 per cent. per annum to be set aside for a sinking fund.

Boiling the profits above enumerated there remains the mill, available for a saw mill, a saw mill, or for polishing granite; anyone or all of which combined must produce a further profit. There are also the freehold land and water-power, available for any factory purpose, constituting another source of profit. Furthermore, there is the possible use of the harbour by adjacent stone proprietors, which would be charged for and yield a profit.

Large orders are pending, and the facilities with which the stone can be shipped, together with the great demand for granite, fully justify the above calculations of immediate and substantial profits.

## REPORT.

## LAMORNA GRANITE QUARRY, AND HARBOUR, AND LAND, NEAR PENZANCE, CORNWALL.

22, Whitehall place, London, S.W.

DEAR SIR,—In accordance with your instructions, I very recently went from London and visited your Lamorna Harbour Works and Quarry, and the lands attached thereto, and made myself acquainted with all the circumstances attending the property as far as it was necessary.

Lamorna Cove, at which the quarry and harbour are situated, is at the south east point of the most westerly part of the coast of Cornwall, where a stream of water, having a watershed of several square miles, discharges itself into the sea.

For some little distance up from the sea the property extends along the south-west side of the stream, and above that for about a quarter of a mile, the land extends along the north-eastern side of it. The former portion is held under lease for a long term, and the latter portion is freehold, some of it being used as pasture for a small portion cultivated, and some left rough. The sea frontage extends from the mouth of the stream at Lamorna Cove for about one-third of a mile westwards, to a point whence the boundary of the property passes over the hill northwards, and ends at a point opposite to the stream before described, about 500 yards from the harbour.

Within the area above described is contained a large mass of granite which is capable of being worked, and for which the harbour forms an excellent outlet, not only for this property but for that north of it, and for adjacent quarries, belonging to other parties, now being worked on the opposite side of the valley on the north-west of the stream before referred to, where, as well as on this property, there is an inexhaustible quantity of granite of the best description.

The Lamorna Quarry has been worked, as I was informed, for about 20 years, and the quality of the stone for engineering and architectural purposes is unsurpassed; in proof of which it may be stated that it has been employed in the present Longships Lighthouse, and some from the immediate neighbourhood in the erection of the new Government Harbour Works, both at Portsmouth and Chatham, as also in construction of the Penzance Harbour and the public buildings in that town.

The harbour itself is formed by a line of quay wall, built parallel to the cliff, and to a jetty or pier, together 323 ft. in length, and enclosing at high water a sufficient area for carrying on a considerable trade, and affording to small shipping shelter from the Atlantic. Its area might be increased inland at a very trifling expense by removing the large beach consisting of granite boulders, which will afford material for constructing a breakwater on the eastern side of the harbour. The latter is dry at low water, and at the high tides there is sufficient water (ranging from 8 to 14 ft.) for small vessels to load alongside the jetty. The bottom is a fine sand, which is a good lying ground. It is perfectly sheltered from the west wind, and almost entirely so from the south-west, being under the protecting point of land on the western and south-western side.

The works that have been constructed (and which are all of the most substantial description) consist of the wharf wall, and the pier or jetty in the harbour, with a quay wall on the sea side; also a higher wharf or platform, about 12 ft. above the level of the sea. Also a lime kiln, a gantry or travelling crane, extending from the quay to the edge of the wharf wall, at which point a powerful crane, already erected, lifts the stone down to the pier, and places it on board the vessels. There are also good carpenter's and smith's shops, &c., and a water wheel attached to a mill house, where machinery of any kind may be worked, especially for polishing or dressing granite; and there is another powerful crane in the quarry, and a considerable quantity of valuable working plant and tools.

A railway of the ordinary stone truck gauge is laid from the quarry to the gantry. On the estate has been erected a good residence, containing ten good rooms, and attached to which, and forming part of the same building, is a large room originally intended for a school-house for the children of the workpeople. There is also a good foreman's house.

The quarry has been worked for some distance into the hill, and about 30 ft. deep, and is proved to be the same fine granite that exists all over the area. The quality of the granite is a good grey kind, differing only from the Aberdeen in containing large quartz crystals. I measured some of the blocks in the rough, as they were lying about, and as they came out of the bed, and I found them weigh from 3 to 5 tons. I estimate that there are about 200 tons in the rough state ready to ship, or capable of being wrought for use before being shipped.

The prices for getting out and squaring the stones is reasonable, and is the usual price paid for similar work in that country, whilst the advantages of the harbour and the estate are not possessed by any other quarry round the coast.

I understood that in consequence of the death of one of the late proprietors of the estate the operations came to a standstill, and the quarry has not been worked for about two years, but during the settlement of his affairs no deterioration has occurred, or any depreciation in value, whilst the wharves and pier have had the great advantage of having their solidity and durability severely tested.

The granite trade was the primary and principal object of the late proprietor's works, and there are additional objects of very profitable trade there—e.g., lime in great request there, both for building and agricultural purposes, and can at present be procured only from Penzance, of an inferior quality, and at a price which for manuring purposes is prohibitory.

Coal in like manner is in great demand all around, and there is a market for thousands of tons yearly, which might be supplied from Lamorna cheaper than from Penzance, by the long land carriage being saved.

Timber, slate, bricks, and tiles of all kinds, and drain-pipes are in constant request, and would doubtless form a large and profitable trade.

Other granite proprietors would probably be glad to avail themselves of the labour at a moderate charge for cranage or wharf dues.

I may add that I learnt during my visit to Cornwall to inspect this property that a company had been recently formed at Penzance for the purpose of building a fisherman's harbour at Newlyn, at the western corner of Penzance, and that they have obtained their Act of Parliament for this purpose, and are about to commence operations.

The undertaking will demand a large quantity of stone and lime, and from the necessity that their materials must be brought by water. In this view of the matter it would be difficult to imagine how any contractor or party could obtain building materials more readily than or so cheaply as from your Lamorna Harbour.

Upon summing up the information which I procured in the locality, and applying to it my experience in similar cases, I am of opinion:—

That the position of the harbour is favourable for shipping granite, and it is accessible by water for coasting vessels, and is available for the other purposes mentioned.

That the estate is capable of supplying an unlimited quantity of the best granite, and it has also an abundant supply of water, which may be turned to various uses, and can if required be stored so as to very much increase the power now available.

That the land affords with water-power sites for factories and manure stores, and forming yards for coal, timber, lime stone for lime, bricks, iron, slates, and pipes, and other necessities, which would be imported by vessels trading for the lime loading, and are very much wanted in that country, coal and lime being greatly in demand there, and there being no supply save by expensive land carriage.

That a tramway would afford access from the most distant part of the estate to the harbour in a cheap and expeditious manner.

That the extent and quality of the stone and the purposes for which it has already been used are the best guarantee of the market that it would command as before mentioned, and the charges would necessarily be very light, both for importing and exporting the stone.

That with the facilities and the convenient arrangement offered by the works, and with a comparatively small capital, a trade might be at once started with the estate already lying there. The small capital sunk would at once make a good return, and the trade was developed and markets opened in various places for the sale of stone on a large scale, as well as for supplying a traffic inwards for a large quantity of granite and mining population.

That the price for working and loading the stone would be light, and there is no competition from harbour dues of all kinds, and that there is no uncertainty as to the quality and quantity of the granite; that the accommodation and facilities for carrying on a large trade exist at present, without requiring the expenditure of large capital; and that there can be no doubt that if properly worked it would be a successful undertaking, inasmuch as the position of the place and the facilities afforded by the possession of such a harbour must render any competition with a traffic impossible.

RICHARD B. GRANTHAM, C.E., F.G.S.

W. H. Owen, Esq.

This work has not yet commenced.

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## In the Court of the Vice-Warden of the Stannaries. Stannaries of Cornwall.

IN THE MATTER OF THE COMPANIES ACT, 1862, and of the NEW WHEAL HENDRA MINING COMPANY.—ALL CREDITORS or CLAIMANTS of the above-named company, who have not received notice from the Official Liquidator thereof that their claims have been already admitted, are hereby required to COME IN and PROVE their SEVERAL DEBTS or CLAIMS at the Registrar's Office, Truro, on Monday, the 11th day of November next, at Eleven o'clock in the forenoon, or, in default thereof, they will be EXCLUDED from the BENEFIT of any DISTRIBUTION made before such proof. And for the purpose of such proof they are to attend in person, or by their solicitors or competent agents, at the time and place above mentioned.

Dated Registrar's Office, Truro, the 28th day of October, 1878.

## WEST TANKERVILLE MINING COMPANY (LIMITED).

## IN LIQUIDATION.

ALL PERSONS claiming to be CREDITORS of the WEST TANKERVILLE MINING COMPANY (LIMITED) are required, on or before the 9th November, 1878, to send a notice, in writing, containing their NAMES and ADDRESSES, and the particulars of their DEBTS or CLAIMS, addressed to the Liquidators of the West Tankerville Mining Company (Limited), 3, Austin Friars, London; or, in default thereof, they will be EXCLUDED from the BENEFIT of any DISTRIBUTION of ASSETS made before such notice shall be received.

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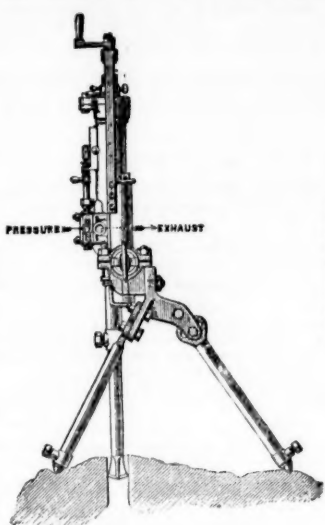
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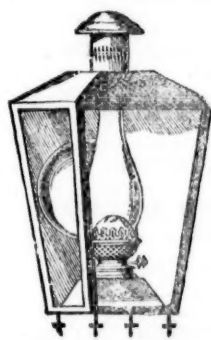
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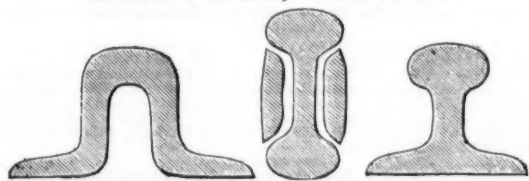
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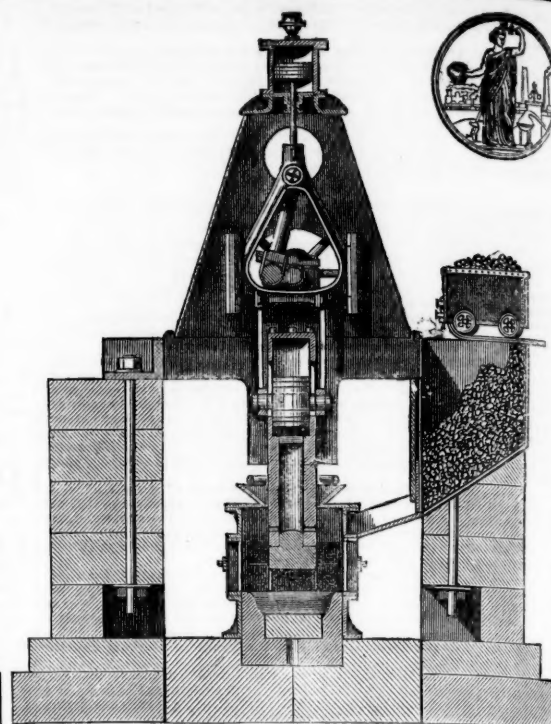
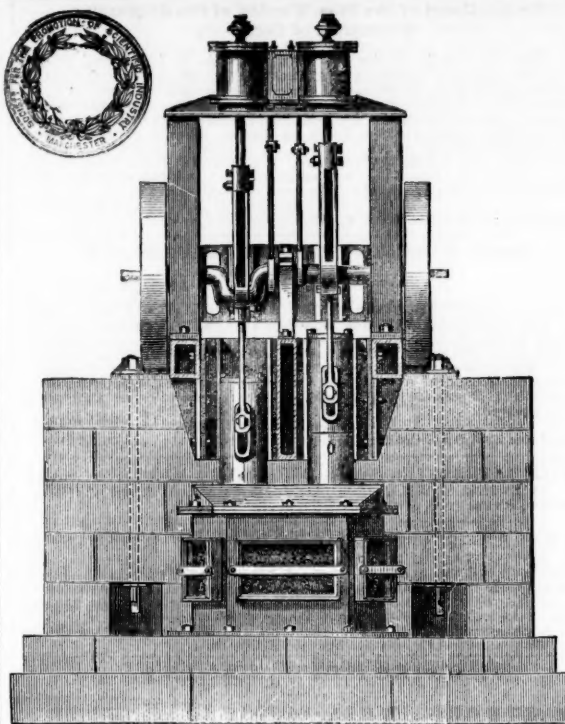
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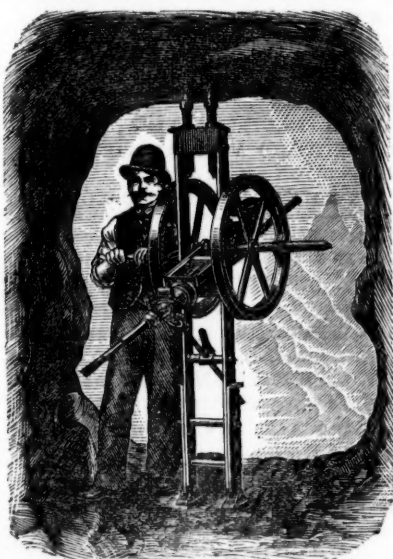
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## THE MINING SHARE LIST.

## BRITISH DIVIDEND MINES.

| Shares | Mines                                      | Paid.    | Last wk. | Clos. pr. | Total divs. | Forst. | Last.      |
|--------|--|----------|----------|-----------|-------------|--------|------------|
| 4000   | Brookwood, c. Buckfastleigh                | 1 10 0   | 1        | 1         | 3 10 0      | 0 0 0  | Nov. 1878  |
| 2000   | Bryn Alyn, c. Denbigh                      | 10 0 0   | 1        | 1         | 0 7 0       | 0 0 0  | Jan. 1877  |
| 10000  | Caron, c. Cardigan                         | 3 0 0    | 2 1/2    | 2 1/2     | 0 4 0       | 0 2 0  | Oct. 1878  |
| 1000   | Carn Brea, c. t. Illogan                   | 55 7 6   | 32 1/2   | 35 40     | 308 0 0     | 1 0 0  | Feb. 1878  |
| 4000   | Cashwell, c. Cumberland                    | 2 10 0   | 1        | 1         | 1 9 0       | 0 2 0  | Aug. 1876  |
| 2150   | Cook's Kitchen, c. Illogan                 | 24 14 9  | 1 1/2    | 1 1/2     | 11 17 0     | 0 7 0  | Jan. 1877  |
| 10240  | Devon Gt. Consols, c. Tavistock            | 1 0 0    | 1 1/2    | 1 1/2     | 116 15 0    | 0 2 0  | July 1877  |
| 4296   | Dolomath, c. t. Camborne                   | 10 14 10 | 25       | 27 29     | 112 15 3    | 0 5 0  | Aug. 1878  |
| 5000   | East Black Craig, c. t. Scotland           | 5 0 0    | 1        | 1         | 0 10 0      | 0 10 0 | Feb. 1877  |
| 300    | East Daren, c. Cardigan                    | 52 0 0   | 1        | 1         | 235 10 0    | 1 0 0  | Aug. 1876  |
| 600    | East Pool, c. t. Illogan                   | 0 9 9    | 8 1/2    | 8 1/2     | 115 19 0    | 0 2 0  | Aug. 1878  |
| 40000  | Glasgow Carr, c. t. p. 10,000 15 p. 10     | 1 1 0    | 1 1/2    | 1 1/2     | 0 13 10     | 0 5 0  | Aug. 1877  |
| 7000   | Gorehead and Merlyn Cons., c. t. Flint     | 2 10 0   | 4        | 3 1/2     | 0 5 0       | 0 5 0  | Aug. 1877  |
| 5000   | Groat Laxey, c. t. Isle of Man             | 4 0 0    | 16       | 14 1/2    | 24 5 0      | 0 6 0  | Oct. 1878  |
| 615    | Gt. Retallack, c. t. Perranabuloe          | 5 18 8   | 1        | 1         | 0 18 0      | 0 1 0  | May 1876   |
| 8000   | Green Huth, c. t. Cardigan                 | 0 0 0    | 1 1/2    | 1 1/2     | 1 8 0       | 0 3 0  | Mar. 1878  |
| 10000  | Grogwyl Ion, c. t. Cardigan                | 2 0 0    | 2 1/2    | 1 1/2     | 0 14 10     | 0 10 0 | Aug. 1878  |
| 9830   | Gunnislake (Chittons), c. t. t.            | 5 5 0    | 1 1/2    | 1 1/2     | 0 13 9      | 0 1 0  | Oct. 1878  |
| 60000  | Holmshush, c. t. s. i. Callington          | 1 0 0    | 1        | 1         | 0 4 0       | 0 0 0  | Sept. 1877 |
| 2000   | Isle of Man, c. t. Isle of Man             | 26 0 0   | 1        | 1         | 82 5 0      | 0 0 0  | Feb. 1878  |
| 30000  | Leadhills, c. t. Lanarkshire               | 8 0 0    | 2 1/2    | 1 1/2     | 0 15 0      | 0 3 0  | Mar. 1878  |
| 1000   | Leisure, c. t. Cardigan                    | 15 15 0  | 50       | 40 50     | 588 10 0    | 1 0 0  | May 1878   |
| 14000  | Llanidloes, c. t. Montgomery               | 3 0 0    | 1        | 1         | 0 9 0       | 0 4 0  | Nov. 1876  |
| 9000   | Marke Valley, c. t. Llanidloes             | 5 3 6    | 1 1/2    | 1 1/2     | 7 15 0      | 0 2 0  | Jan. 1878  |
| 10000  | Mellandale Copper, Hayle                   | 2 0 0    | 4        | 3 1/2     | 0 5 0       | 0 3 0  | July 1876  |
| 2000   | Minera Mining Co., c. t. Wrexham           | 5 0 0    | 10       | 8 10      | 67 15 0     | 0 2 0  | Sept. 1878 |
| 20000  | Miners Co. of Ireland, c. t. t.            | 7 0 0    | 1        | 1         | 23 17 6     | 0 2 0  | Jan. 1878  |
| 444    | North Bury, c. t. Chacewater               | 3 9 6    | 1        | 1         | 2 0 0       | 0 1 0  | Nov. 1878  |
| 10240  | North Hendre, c. t. Wales                  | 2 1 0    | 1        | 1         | 2 7 6       | 0 5 0  | June 1878  |
| 30000  | Panty Mwyn, c. t. Mold (8794 lss.)         | 2 0 0    | 5 1/2    | 5 5 1/2   | 0 3 0       | 0 2 0  | Aug. 1877  |
| 6000   | Pennine and Merlyn Cons., c. t. Redruth    | 0 8 6    | 1        | 1         | 0 9 0       | 0 9 0  | June 1877  |
| 6000   | Pennine, c. t. Redruth                     | 3 2 6    | 1        | 1         | 8 15 6      | 0 2 0  | July 1878  |
| 6000   | Pennine, c. t. Redruth                     | 6 0 0    | 4 1/2    | 4 1/2     | 0 10 0      | 0 5 0  | Mar. 1878  |
| 4500   | Pennine, c. t. Redruth                     | 2 0 0    | 1 1/2    | 1 1/2     | 0 2 0       | 0 2 0  | Nov. 1876  |
| 10000  | Prince Patrick, c. t. s. i. Holywell       | 1 0 0    | 1 1/2    | 1 1/2     | 0 14 0      | 0 1 0  | Jan. 1878  |
| 10000  | Red Rock, c. t. Cardigan                   | 2 0 0    | 2 1/2    | 2 1/2     | 0 4 0       | 0 2 0  | Jan. 1878  |
| 10000  | Roman Gravel, c. t. Salop                  | 7 10 0   | 6 1/2    | 6 1/2     | 7 15 0      | 0 5 0  | Mar. 1877  |
| 512    | South Cardigan, c. t. St. Cleer            | 1 5 0    | 60       | 50 60     | 743 10 0    | 1 0 0  | Sept. 1878 |
| 12000  | South Cardigan, c. t. St. Cleer            | 6 5 6    | 10 1/2   | 10 11     | 4 10 0      | 0 0 0  | Aug. 1878  |
| 12000  | St. Harmon, c. t. Montgomery               | 3 0 0    | 3        | 2 3       | 0 12 0      | 0 3 0  | Oct. 1878  |
| 10000  | St. Patrick, c. t. s. i. (6000 sh. issued) | 1 0 0    | 1        | 1         | 0 7 0       | 0 1 0  | Oct. 1876  |
| 4500   | South Wh. Frances, c. t. Illogan           | 7 12 4   | 4 1/2    | 5 5 1/2   | 37 5 0      | 0 5 0  | Sept. 1878 |
| 10000  | Tinkertown, c. t. Salop                    | 4 0 0    | 4        | 3 3/4     | 0 5 0       | 0 5 0  | Oct. 1876  |
| 10000  | Tinkertown, c. t. Salop                    | 11 10 0  | 7        | 5 0       | 50 8 0      | 0 5 0  | Oct. 1876  |
| 16000  | Van, c. t. Llanidloes                      | 4 0 0    | 16       | 14 15     | 23 5 0      | 0 5 0  | Oct. 1878  |
| 3000   | W. Chiverton, c. t. Perranabuloe           | 12 10 0  | 2        | 1 1/2     | 55 10 0     | 0 10 0 | Feb. 1878  |
| 178    | West Fildes, c. t. Redruth                 | 10 0 0   | 1        | 1         | 1 19 0      | 0 4 0  | July 1876  |
| 412    | West Fildes, c. t. Redruth                 | 44 42 4  | 1 1/2    | 1 1/2     | 32 0 0      | 0 0 0  | Nov. 1877  |
| 2048   | West Wheel Frances, c. t. Illogan          | 28 8 9   | 1 1/2    | 1 1/2     | 445 0 0     | 0 6 0  | Oct. 1872  |
| 600    | West Wheel Frances, c. t. Illogan          | 5 0 0    | 1 1/2    | 1 1/2     | 0 12 0      | 0 15 0 | Apr. 1878  |
| 12000  | West Wheel Frances, c. t. Illogan          | 3 0 0    | 2 1/2    | 2 1/2     | 19 10 0     | 0 10 0 | Oct. 1877  |
| 1024   | West Wheel Frances, c. t. Illogan          | 18 0 0   | 1        | 1         | 11 9 0      | 0 5 0  | June 1878  |
| 2048   | Wheel Kite, c. t. St. Agnes                | 5 13 10  | 1 1/2    | 1 1/2     | 11 9 0      | 0 5 0  | June 1878  |
| 4296   | Wheel Kite, c. t. St. Agnes                | 4 6 6    | 1 1/2    | 1 1/2     | 0 8 0       | 0 4 0  | Sept. 1877 |
| 25000  | Wh. Newton, c. t. s. i. Calstock           | 1 0 0    | 1        | 1         | 522 10 0    | 0 4 0  | Aug. 1872  |
| 8000   | Wh. Newton, c. t. s. i. Calstock           | 161 5 0  | 20       | 15 20     | 0 10 0      | 0 5 0  | Aug. 1878  |
| 3000   | Wh. Newton, c. t. s. i. Calstock           | 7 11 0   | 6 1/2    | 6 1/2     | 0 4 0       | 0 1 0  | July 1877  |
| 10000  | Wye Valley, c. t. Montgomery               | 3 0 0    | 2 1/2    | 2 1/2     | 0 10 6      | 0 4 0  | Oct. 1878  |

## FOREIGN DIVIDEND MINES.

| Shares | Mines  | Paid.   | Last wk. | Clos. pr. | Total divs.  | Forst. | Last.      |
|--------|--|---------|----------|-----------|--------------|--------|------------|
| 25500  | Almaden, c. t. Spain                             | 2 0 0   | 1 1/2    | 1 1/2     | 1 19 0       | 0 0 0  | Oct. 1878  |
| 30000  | Almaden, c. t. Spain                             | 1 0 0   | 1 1/2    | 1 1/2     | 0 5 0        | 0 1 0  | May 1876   |
| 20000  | Australian, c. t. South Australia                | 7 7 6   | 1 1/2    | 1 1/2     | 1 1 0        | 0 2 0  | July 1878  |
| 10000  | Battle Mountain, c. t. (6240 part pd.)           | 5 0 0   | 1        | 1         | 0 10 0       | 0 10 0 | Nov. 1872  |
| 15000  | Battle Mountain, c. t. (6240 part pd.)           | 4 0 0   | 1        | 1         | 0 10 0       | 0 10 0 | Nov. 1872  |
| 20000  | Cape Copper Mining, c. t. Africa                 | 7 0 0   | 1        | 1         | 0 14 0       | 0 2 0  | June 1874  |
| 34433  | Cedar Creek, c. t. California                    | 8 0 0   | 20       | 25 28     | 32 5 0       | 0 17 0 | Sept. 1878 |
| 25000  | Cesar's Creek, c. t. California                  | 10 0 0  | 1        | 1         | 0 18 0       | 0 2 0  | June 1878  |
| 15000  | Chicago, c. t. Utah                              | 10 0 0  | 1 1/2    | 1 1/2     | 2 8 0        | 0 2 0  | Aug. 1878  |
| 65000  | Colorado United, c. t. Colorado                  | 8 0 0   | 2 1/2    | 2 1/2     | 0 18 0       | 0 4 0  | Nov. 1876  |
| 10000  | Copago, c. t. Chile (250 shares)                 | 15 15 0 | 1        | 1         | 7 11 5       | 0 3 0  | Mar. 1878  |
| 10000  | Don Pedro North of the Rey                       | 0 16 0  | 1        | 1         | 3 8 0        | 0 2 0  | Mar. 1872  |
| 25500  | Eberhardt & Aurora, c. t. Nevada                 | 10 0 0  | 4        | 3 1/2     | 1 8 0        | 0 3 0  | Dec. 1877  |
| 70000  | English & Australian, c. t. St. Aust.            | 2 10 0  | 1 1/2    | 1 1/2     | 2 15 0       | 0 1 0  | Mar. 1877  |
| 80000  | Flagstaff, c. t. Utah                            | 10 0 0  | 1 1/2    | 1 1/2     | 4 2 0        | 0 1 0  | July 1872  |
| 20000  | Fortuna, c. t. Spain                             | 2 0 0   | 4 1/2    | 3 1/2     | 7 3 2        | 0 3 0  | Oct. 1878  |
| 55000  | Frederick & Bolivia, c. t. New Gran.             | 2 0 0   | 2 1/2    | 1 1/2     | 0 2 6        | 0 1 0  | Oct. 1878  |
| 20000  | Gold Run, c. t. Nevada                           | 1 0 0   | 1        | 1         | 0 2 4        | 0 4 0  | Oct. 1872  |
| 80000  | Kapunda Mining Co. Australia                     | 1 3 0   | 1        | 1         | 0 2 4        | 0 4 0  | June 1872  |
| 20000  | Last Chance, c. t. Utah                          | 5 0 0   | 1 1/2    | 1 1/2     | 0 14 0       | 0 2 0  | Oct. 1878  |
| 15000  | Llanes, c. t. Spain                              | 3 0 0   | 4 1/2    | 4 1/2     | 17 10 4      | 0 2 0  | Oct. 1878  |
| 85000  | Llanes, c. t. Spain                              | 2 0 0   | 1 1/2    | 1 1/2     | 0 10 0       | 0 1 0  | Oct. 1878  |
| 1887   | Llanes, c. t. Spain                              | 3 10 0  | 1 1/2    | 1 1/2     | 1 11 6       | 0 1 0  | Oct. 1878  |
| 5000   | Mamm Copperopolis of Utah, c. t.                 | 10 0 0  | 1        | 1         | 0 8 0        | 0 5 0  | Dec. 1872  |
| 6000   | Mountain Chief, c. t. Utah                       | 10 0 0  | 1        | 1         | 0 4 0        | 0 4 0  | Jan. 1878  |
| 10000  | Pontigault, c. t. France                         | 20 0 0  | 28       | 26 28     | 25 19 11     | 0 11 0 | Jan. 1878  |
| 100000 | Port Phillip, c. t. Clunes                       | 1 0 0   | 1        | 1         | 1 11 0       | 0 1 0  | Oct. 1878  |
| 54000  | Richmond Consols, c. t. Nevada                   | 5 0 0   | 10       | 9 1/2     | 6 11 0       | 0 10 0 | Nov. 1878  |
| 40000  | Santa Barbara, c. t. Brazil                      | 0 10 0  | 1 1/2    | 1 1/2     | 0 4 0        | 0 1 0  | May 1878   |
| 120000 | Scottish Australian Mining Co. t.                | 1 0 0   | 1 1/2    | 1 1/2     | 15 per cent. | 0 1 0  | Apr. 1878  |
| 80000  | Scottish Austral. Mining Co. New                 | 0 10 0  | 1 1/2    | 1 1/2     | 15 per cent. | 0 1 0  | May 1878   |
| 12000  | Sierra Buttes, c. t. California                  | 2 0 0   | 1 1/2    | 1 1/2     | 1 18 0       | 0 2 0  | Oct. 1877  |
| 140828 | S. B. Pumas Eureka                               | 2 0 0   | 3        | 2 1/2     | 0 18 0       | 0 2 0  | Apr. 1877  |
| 255000 | St. John del Rey (25 stock & multiples dealt in) | 280 290 | 1        | 1         | 0 14 2       | 0 2 0  | Nov. 1873  |
| 20000  | Tollins, c. t. America                           | 5 0 0   | 1        | 1         | 15 per cent. | 0 1 0  | June 1878  |
| 25000  | Victoria, c. t. Australia                        | 1 0 0   | 1 1/2    | 1 1/2     | 0 12 6       | 0 8 0  | May 1874   |
| 15000  | Western London, c. t. New Gran.                  | 5 0 0   | 1 1/2    | 1 1/2     | 0 12 0       | 0 12 0 | July 1878  |
| 91000  | W. Prussian (5500 pref. sh. 101 pd)              | 10 0 0  | 10 1/2   | 10 10 1/2 | 1 0 0        | 0 4 0  | Oct. 1878  |

## NON-DIVIDEND FOREIGN MINES.

| Shares     | Mines.   | Paid.  | Last Pr. | Clos. Pr.   | Last Call. | 1878 |
|------------|--|--------|----------|-------------|------------|------|
| 12000      | Argentine, <i>g</i> , Argentine Republic                                   | 5 0 0  | —        | —           | ..Fully    | 20   |
| 8000       | Bellavista, <i>s</i> , Peru (210 shares)                                   | 10 0 0 | —        | 3/4 3/4     | ..Fully    | 51   |
| 8000       | Blue Tent, <i>Hyd.</i> , California  | 5 0 0  | —        | —           | ..Fully    | pd.  |
| 10000      | Buenaventura, <i>g</i> , <i>s</i> , Llanos de las Infantas, Spain (£2 sh.) | 0 0 50 | 3        | 2 3/4 3     | ..Fully    | pd.  |
| 49938      | Chonales, <i>g</i> , <i>s</i> , Nicaragua*                                 | 2 0 0  | —        | —           | ..Oct.     | 1878 |
| 10000      | Condes de Chili, <i>r</i>  | 5 0 0  | —        | 3/4 3/4     | ..Fully    | pd.  |
| 20000      | English Australian, <i>s</i> , Victoria*                                   | 1 0 0  | —        | 3/4         | ..Fully    | pd.  |
| 45000      | Excelsior Hydraulic Gold Washing Co., California*                          | 6 0 0  | —        | 3/4 3/4     | ..Fully    | pd.  |
| 100000     | Exchequer, <i>g</i> , <i>s</i> , California†                               | 1 0 0  | —        | —           | ..Dec.     | 1871 |
| 40000      | Holcombe Valley, <i>g</i> , <i>s</i> , California                          | 1 0 0  | —        | 3/4 3/4     | ..Fully    | pd.  |
| 8000       | Hornehosch, <i>s</i> , <i>s</i> , Spain                                    | 1 0 0  | —        | —           | ..Fully    | pd.  |
| 12000      | Hultfall, <i>s</i> , <i>s</i> , Orebro, Sweden                             | 10 0 0 | 12       | 10 11       | ..Fully    | pd.  |
| 12000      | Hunter Consolidated, <i>s</i> , Utah                                       | 5 0 0  | 3 1/2    | 3 3/4       | ..Fully    | pd.  |
| 20000      | Imperial Brazilian Collieries, Brazil*                                     | 10 0 0 | —        | —           | ..Fully    | pd.  |
| 7500       | Isabelle, <i>g</i> , <i>s</i> , California (250 shares)                    | 5 0 0  | —        | —           | ..Fully    | pd.  |
| 100000     | J. L. & Co., <i>s</i> , California*  | 5 0 0  | 17 1/2   | —           | ..Oct.     | 1878 |
| 50000      | Javali, <i>g</i> , <i>s</i> , Nicaragua*                                   | 1 0 0  | 3/4      | 3/4 3/4     | ..Fully    | pd.  |
| 3500       | La Mancha, <i>i</i> , Newfoundland   | 2 0 0  | 9 1/2    | 7 1/2 9 1/2 | ..Fully    | pd.  |
| 12000      | Llanesota, <i>s</i> , <i>s</i> , Vicaya, Spain (£2 shares)                 | 10 0 0 | —        | —           | ..Fully    | pd.  |
| 75000      | Malabar, <i>g</i> , Colombia* (67185 issued)                               | 1 15 0 | —        | —           | ..Mar.     | 1876 |
| 40000      | Malpaso, <i>g</i> , Colombia* (7400 pref. shares, fully paid)...           | 1 0 0  | 3/4      | 3/4 3/4     | ..Fully    | pd.  |
| 12000      | Menzenberg, <i>c</i> , Honnet, Germany*                                    | 1 0 0  | 3/4      | 3/4 1       | ..Fully    | pd.  |
| 4588       | New Bensberg, <i>i</i> , <i>i</i> , Germany...                             | 5 0 0  | —        | —           | ..Fully    | pd.  |
| 60000      | New Quebrada, <i>c</i> , Venezuela*  | 5 0 0  | —        | —           | ..Nov.     | 1878 |
| 20000      | New Zealand Kapanga, <i>g</i> , Coromandel                                 | 5 0 0  | 1 1/2    | 1 1/2 1 1/2 | ..Fully    | pd.  |
| 3000       | Oregon, <i>g</i> , Oregon, U.S. (preference shares)                        | 4 0 0  | 13       | 13 1/2      | ..Fully    | pd.  |
| 50000      | Pauline, <i>c</i> , Chili† (250000 debentures)                             | 4 0 0  | —        | —           | ..Fully    | pd.  |
| 50000      | Pestana United, <i>g</i> , Italy†  | 4 0 0  | 1 1/2    | 3/4 1 1/2   | ..Fully    | pd.  |
| 25000      | Pitangu, <i>g</i> , Brazil (incl. 6000 sh. 21 fully paid)                  | 5 0 0  | 3/4      | 3/4 3/4     | ..Fully    | pd.  |
| 25000      | Placeville, <i>g</i> , <i>g</i> , California                               | 5 0 0  | —        | —           | ..Aug.     | 1878 |
| 50000      | Providencia and New Rosario, <i>s</i> , Mexico*                            | 2 0 0  | 2 1/2    | 2 1/2 2 1/2 | ..Fully    | pd.  |
| 40000      | Ravenscliff, <i>g</i> , New Zealand; <i>c</i> , South Australia...         | 1 0 0  | —        | —           | ..Fully    | pd.  |
| 50000      | Rica, <i>g</i> , Colombia* (40000 issued)                                  | 0 0 50 | 3/4      | 3/4         | ..July     | 1878 |
| 22,131,000 | Rio Tinto, <i>c</i> , Huelva, Spain  | 1 0 0  | —        | 3/4 3/4     | ..Fully    | pd.  |
| 00000      | Rosa Grande, <i>g</i> , Brazil† (21 shares)                                | 53     | 53       | 57 59       | ..Fully    | pd.  |
| 30040      | Russia Copper, Orenburg and Ufa†   | 1 0 0  | 3/4      | 3/4         | ..Fully    | pd.  |
| 10000      | Silver Plume, <i>s</i> , Colorado*   | 10 0 0 | —        | —           | ..Fully    | pd.  |
| 50000      | Tecoma, <i>s</i> , Utah*   | 1 0 0  | —        | —           | ..Fully    | pd.  |
| 43174      | United Mexican, <i>s</i> , Mexico††  | 10 0 0 | 3/4      | 3/4 3/4     | ..May      | 1878 |
| 14000      | Utah, <i>g</i> , <i>s</i> , Utah   | 29 0 3 | 8 1/2    | 3 3/4       | ..Fully    | pd.  |
| 50000      | Virneberg, <i>c</i> Rheinlathbach, Germany*                                | 5 0 0  | —        | —           | ..Fully    | pd.  |
| 15000      | Yorke Peninsula, <i>c</i> , South Australia                                | 2 0 0  | —        | —           | ..Fully    | pd.  |
| 64500      | Yorke Peninsula, <i>c</i> , South Australia Preference                     | 1 0 0  | 3/4      | 3/4 3/4     | ..Fully    | pd.  |